AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

Entered as second-class matter at the postoffice, Dalton, Ga., under Act of March 3, 1879.

Volume 87
Number One
$1.00 a Year.

NOVEMBER, 1922

Published monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

"HARDEST, SMOOTHEST PORCELAIN IN THE WORLD"

ADAMANT

(Reg. U. S. Pat. Office)

PORCELAIN GUIDES
for
TEXTILE MACHINERY

The average manufacturer does not appreciate the enormous amount of damage that an imperfect guide can cause in the manufacture of textiles.

Mitchell-Bissell Co.

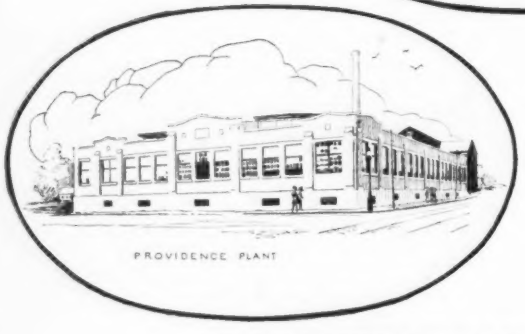
334 FOURTH AVENUE
NEW YORK

FACTORY, TRENTON, N. J.

Write for Catalogue

TS1550
.C8

Largest Yarn Dyeing Capacity In United States



JOB DYERS OF YARN IN WOUND FORM

All classes of colors from Cheapest to Best

COTTON YARN

We receive cotton yarn on bobbins, tubes, cones or cops, dye it on Universal wound parallel tubes and return it to you, without waste, on these tubes or on cones.

WORSTED YARN

We receive worsted yarn, both single and ply, on bobbins, tubes or cones, dye it on Universal wound parallel tubes and return it on these tubes or on cones.

We also receive worsted yarn on jackspools, dye it on our special perforated dyeing spools and return it to you on the original jackspools.

MISCELLANEOUS

We also dye Merino yarn, silk noils, mohair yarn, cotton novelty yarns of all kinds and multiple wound yarns for insulating.

A BIG SAVING TO YOU

The Franklin Process of dyeing eliminates skeins and long chains, thus reducing yarn waste to a negligible quantity in all kinds of dyeing. This saving is particularly important in the dyeing of fine count yarns. Here also we can probably save you considerable money in the cost of actual dyeing.

QUALITY AND SERVICE

Goods made of Franklin dyed yarns are noted for the brilliancy, solidity and complete penetration of color. Having the largest yarn dyeing capacity in the United States, we are in a position to give good service as well as the best in quality.

WRITE TODAY

If you will write to our nearest office stating your dyeing problem, we will be glad to have a representative call to make recommendations without obligating you in any way.

FRANKLIN PROCESS CO.

Philadelphia PROVIDENCE Manchester, Eng.

New York Office, 72 Leonard Street

SOUTHERN FRANKLIN PROCESS CO.

Greenville, S. C.

MIRROR DROP WIRES

TRADE-MARK REG. U. S. PAT. OFF.

Having greatly improved the finish of our Northrop Loom Drop Wires we have adopted the trade-mark

MIRROR

to identify the drop wires of our manufacture and each shipment will contain a slip bearing this trade-mark

Although our prices for drop wires are higher than others that may be purchased, the superior finish of our drop wires makes them worth much more than the difference in price

IT DOES NOT PAY to polish the eyes of drop wires with the warp yarns, after reaching the loom

It takes too long and warps are too expensive

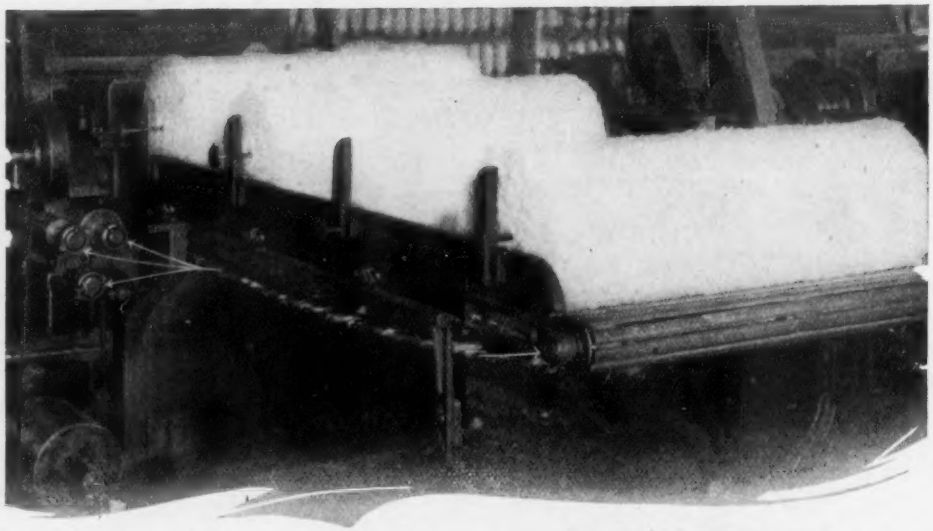
DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

ATLANTA GEORGIA

Copyright 1917 by Draper Corporation

SKF



Ball Bearings on Apron Rolls Eliminate

Belt Slippage. Result—More Uniform Lap

THE friction of plain bearings on apron rolls of pickers throws a considerable load upon the evener rolls. This frequently causes the belt to slip on the cone, resulting in variations of speed and an uneven lap.

This belt slippage may be minimized by mounting the apron rolls on SKF marked self-aligning ball bearings which run freely even under conditions of misalignment.

With apron and evener rolls thus equipped, one mill found that less than one percent of the laps were below standard, as compared with 40 percent when plain-bearing equipment was used.

Furthermore, there is no danger of oil damage for ball bearing housings are effectively sealed against the escape of lubricant, and since ball bearings show no appreciable wear, adjustments and renewals are rarely required. Let our engineering department submit plans for a change over to ball-bearing equipment.

THE SKAYEF BALL BEARING COMPANY

Supervised by SKF INDUSTRIES, INC., 165 Broadway, New York City

851

Normal View

Deflected View

BALL BEARINGS

The Highest Expression of the Bearing Principle

"Obligation"

Many weaving mills have placed their shuttle problems entirely in our hands.

We appreciate the burden of this responsibility and accept it as an Obligation to be discharged faithfully and to the very best of our ability.

With the realization

That only so long as we make the best shuttle possible to produce and sell it at a fair price—

That prompt deliveries are vitally essential in the acceptance of shuttle contracts from busy mills—

That customers' specifications must be met—

We say to our customers, both present and prospective, that we accept our Obligation fearlessly and with every assurance to you of its fulfillment.

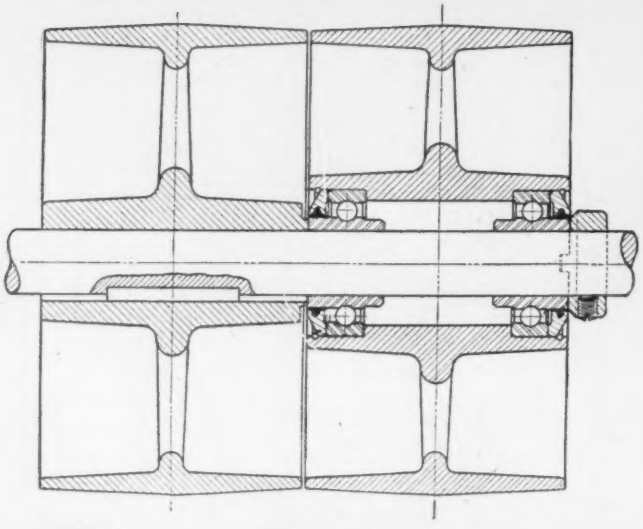
Shambow Shuttle Company

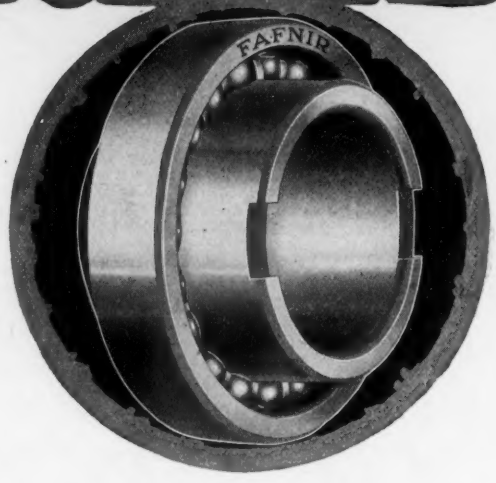
Woonsocket, R. I. **Greenville, S. C.**

JOHN C. SHAMBOW,
Pres. & Treas.

H. H. ULLMAN,
V.-Pres. & Gen. Mgr.

FAFNIR





Those Bothersome Loose Pulleys Needn't Bother You Any Longer

You know what a nuisance plain bearing loose pulleys can be. The bushing wears; the shaft is scored; the shaft continues to run, and the pulley makes an awful racket.

All this trouble can easily be avoided by installing **Fafnir Transmission Ball Bearings** as shown in the accompanying cross-section.

We furnish the ball bearings, end caps and retaining wires, and driving collar, complete for each unit.

It is a simple matter to install the **Fafnir Transmission Ball Bearings** in the pulley, slip the pulley on the shaft as a completely assembled unit, and adjust the driving collar.

There is no need of your being bothered with plain bearing loose pulleys any longer, and we suggest that you write for charts of bearing and housing dimensions, and prices of units for shaft sizes in which you are interested.

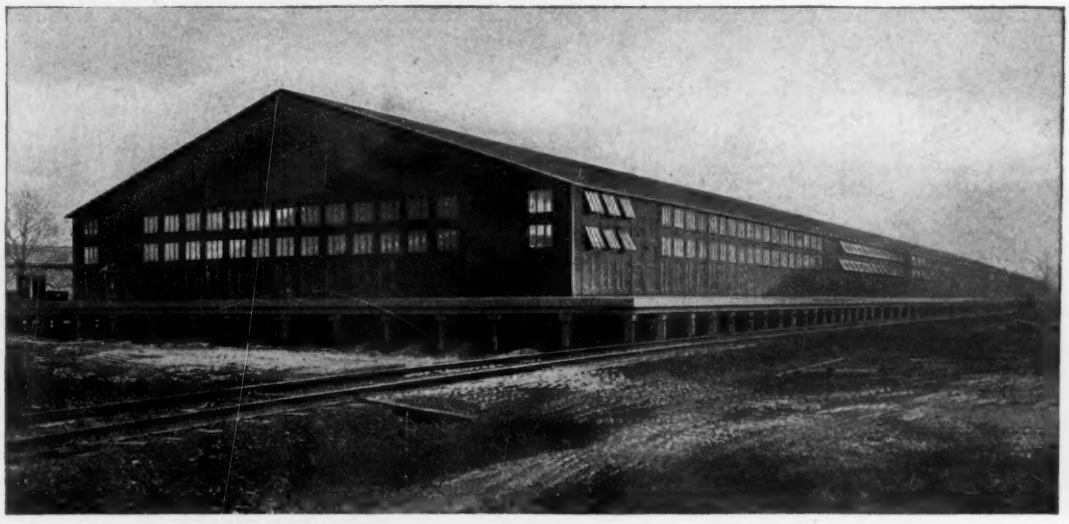
FAFNIR The Red Dragon Line

THE FAFNIR BEARING COMPANY

Conrad Patent Licensee

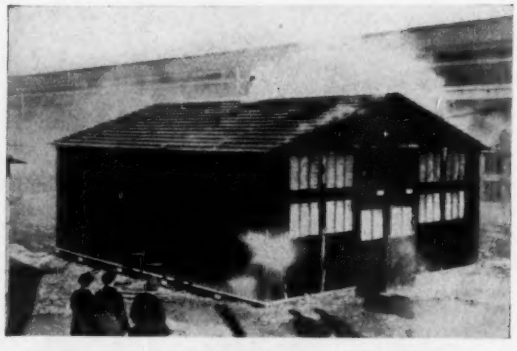
New Britain, Conn.

SOUTHERN REPRESENTATIVE, O. R. S. POOL
P. O. Box 1375 Greenville, S. C.



For Cotton Warehouses

TRUSCON STANDARD BUILDINGS



Tested By Fire

An actual test was made at our plant to demonstrate the applicability of Truscon Standard Buildings for cotton warehouses. During a fire lasting two and three-quarter hours a temperature of 1900° was registered, which would hardly be equalled in any plant fire. The results obtained have caused Truscon Standard Buildings to be the only steel buildings approved by the Underwriters' Laboratories, Inc., for storage of treated cotton.

Fireproofness is the first necessity. Built entirely of steel, including doors, windows, etc., Truscon Standard Buildings have nothing about them that can burn. Walls and roof are made of Truscon Alloy Steel, insuring utmost permanence.

High salvage value is an asset in the cotton industry. Because of their unit construction, Truscon Standard Buildings can at any time be dismantled and re-erected in a new location with 100% salvage value.

The combinations of interchangeable steel units make Truscon Standard Buildings adaptable to all conditions as well as though built to order. They are furnished in pitched, monitor or saw-tooth roofs, all lengths with any arrangement of doors and windows, and in a great variety of widths. If you are planning to build, write us for suggestions, catalog and prices.

Truscon Steel Co.

Youngstown, Ohio

Warehouses and Sales Offices in Principal Cities.

STAFFORD
AUTOMATIC LOOMS

A Noteworthy Demonstration

Stafford Automatic Looms will weave successfully practically any cotton fabric which can be made on a 1 x 1 loom.

At the recent Greenville Exposition seven Stafford looms were shown—four bobbin-changers and three shuttle-changers, weaving the following fabrics:

Bobbin-Changing Looms

1. 10/4 loom weaving standard broad sheeting.
2. 36″ loom weaving fancy shirting, with a Stafford 20 harness dobby.
3. 32″ loom weaving denim.
4. 40″ loom weaving print cloth.

Shuttle-Changing Looms

1. 10/4 Sheeting loom.
2. 40″ loom weaving Marquisette cloth.
3. 40″ loom weaving fine lawn, using both cop and rewound bobbin filling.

These looms were operated twelve hours per day for six days under adverse conditions without a break of any kind. While no record of production was kept no looms could have operated to better advantage under any conditions.

These Stafford looms were running true to form and were merely demonstrating on a small scale what they are doing in a large way in some of the most representative mills in the United States and Canada.

THE STAFFORD COMPANY

Weaving Machinery

READVILLE, MASS.

Branch Office—Paterson, N. J.

Southern Agent
J. H. Mayes,
Charlotte, N. C.

Canadian Representatives
Whitehead, Emmans, Ltd.,
Montreal, Quebec.

LIGHT,

Are you really certain that the lighting in your factory is all that it should, and can be? Wouldn't it be advisable to, at least, make an investigation? It would cost nothing.

It is strange, indeed, that industrial lighting discussions are so often passed by with the remark, "Oh, this better lighting talk is meant for the other fellow, not me."

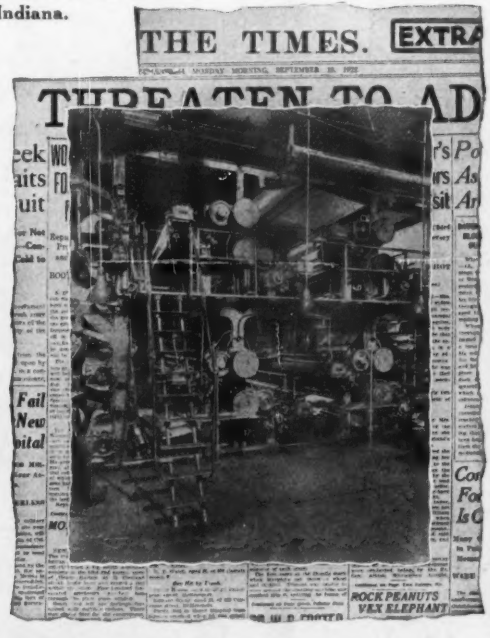
Wide-awake newspapers where "speed and accuracy is everything" use good illumination like that afforded with Westinghouse-Cutter reflectors. In this respect, is your business radically different?

Expert advice on industrial illumination (the kind you would freely pay for, if necessary) is yours for the asking. Two illuminating engineering bureaus, established at two different cities, plus a large staff of industrial lighting specialists, will give your problems personal attention, without cost.

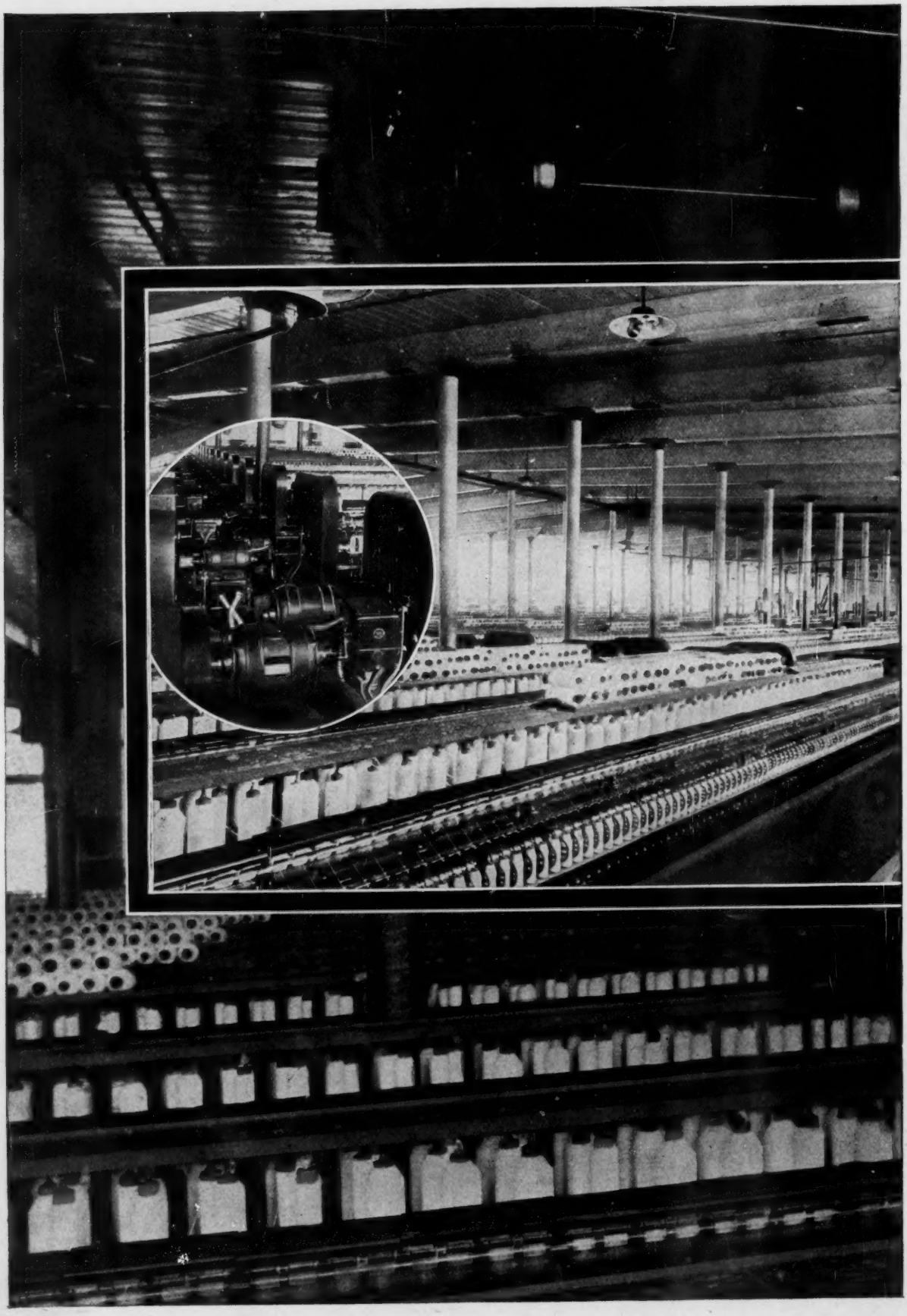
Write to this address

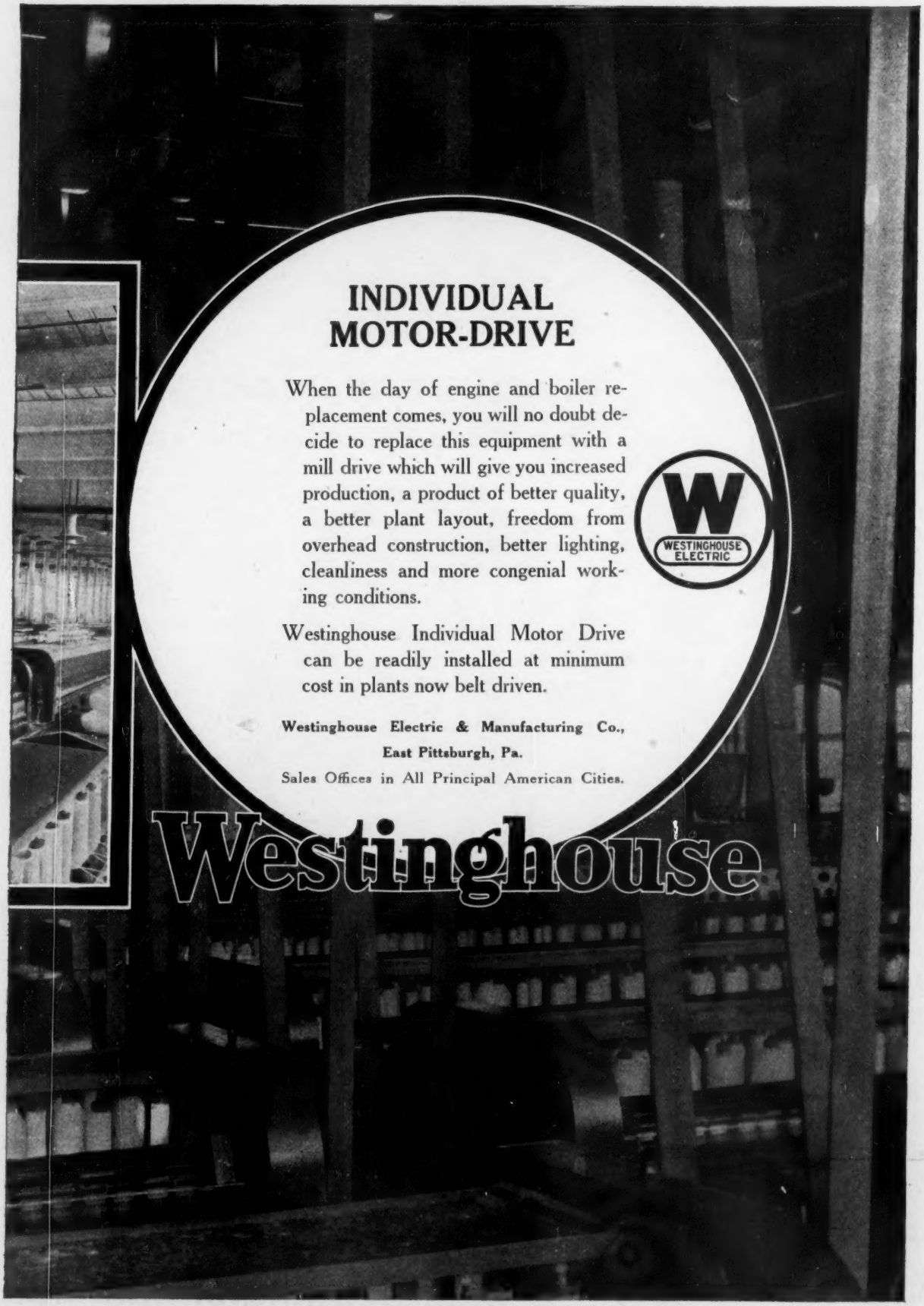
Westinghouse Electric & Manufacturing Company
George Cutter Works, South Bend, Indiana.

Westinghouse-Cutter Holder Socket Reflector of Standard Angle Type as installed in this newspaper press-room.

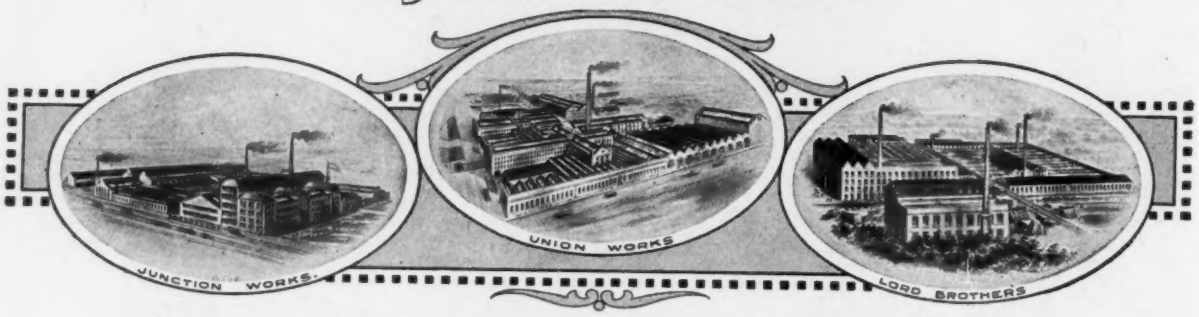


Westinghouse




INDIVIDUAL
MOTOR-DRIVE
When the day of engine and boiler replacement comes, you will no doubt decide to replace this equipment with a mill drive which will give you increased production, a product of better quality, a better plant layout, freedom from overhead construction, better lighting, cleanliness and more congenial working conditions.
Westinghouse Individual Motor Drive can be readily installed at minimum cost in plants now belt driven.
Westinghouse Electric & Manufacturing Co.,
East Pittsburgh, Pa.
Sales Offices in All Principal American Cities.
W
WESTINGHOUSE
ELECTRIC
Westinghouse

BROOKS & DOXEY
(1920) LIMITED

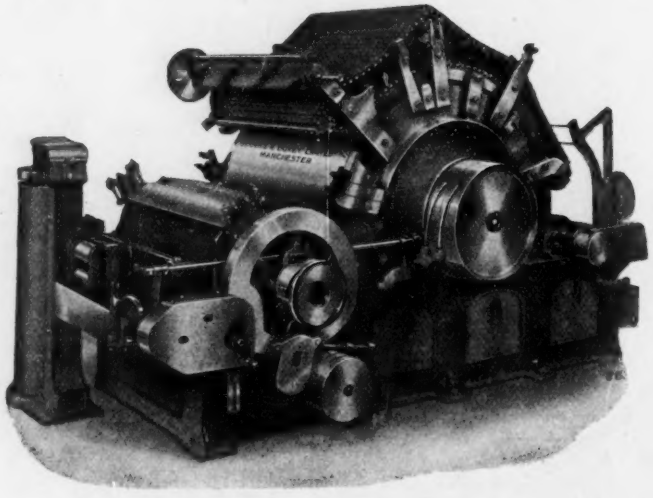


TEXTILE MACHINERY MAKERS
For the Cotton, Cotton Waste, Wool and Silk Trades.

Mixing, Opening, Carding, Preparing, Spinning, Winding, and Doubling Machinery for Cotton; Machinery for Waste Opening, Carding, and Spinning on Various Systems; Self-acting Mules and Cheese Winders for Wool.

Polishing Machines for Sewing Thread; Patent Conditioning Machine for Yarn on Ring Bobbins.

Cables: "UNION" Manchester, Eng.



REVOLVING FLAT CARD

Constructed to give the maximum rigidity necessary for accurate setting and perfect running. Facings, joints, pedestals and brackets steady-pinned in position where necessary, obviating re-adjustment after being set to work. The tendency of ordinary keys to slip off their flats when subjected to the strain of starting is overcome by keying on all pulleys and most wheels by patent semi-circular keys recessed in the shafts.

Patent Splicing Machine for the "Knotless" Yarn trade; Roving Waste Openers; Thread Extractors and Spinning and Doubling Frames for Silk.

Also Tin Rollers, Fluted and Plain Rollers, Spinning and Doubling Spindles, Rings, etc.

Codes: A. B. C. 5th, Bentley's, Liebers and A. 1.

HEAD OFFICE:- UNION IRON WORKS, WEST GORTON, MANCHESTER, ENG.

INCORPORATING LORD BROS. TODMORDEN.

Maintenance cost is low

LUNKENHEIMER REGRINDING VALVES

have proved this true by the results they have given in every class of service, extending over a period of half a century.

The success of Lunkenheimer Regrinding Valves is determined and made certain by the Lunkenheimer method of manufacture, which provides a special bronze composition for each part, depending on the function the part performs, making the valves as near wearproof as can be attained. Sincere workmanship together with rigid tests and inspection are further assurance of satisfactory service to the user.

The regrinding seating surfaces provide ready means for effecting repairs when necessary and at small cost.

Globe, Angle and Cross Valves, and Horizontal, Angle, Vertical and Swing Check Valves for pressures up to 200 and 300 pounds.

Booklet 517-AK lists and describes the entire line. Shall we send you a copy?

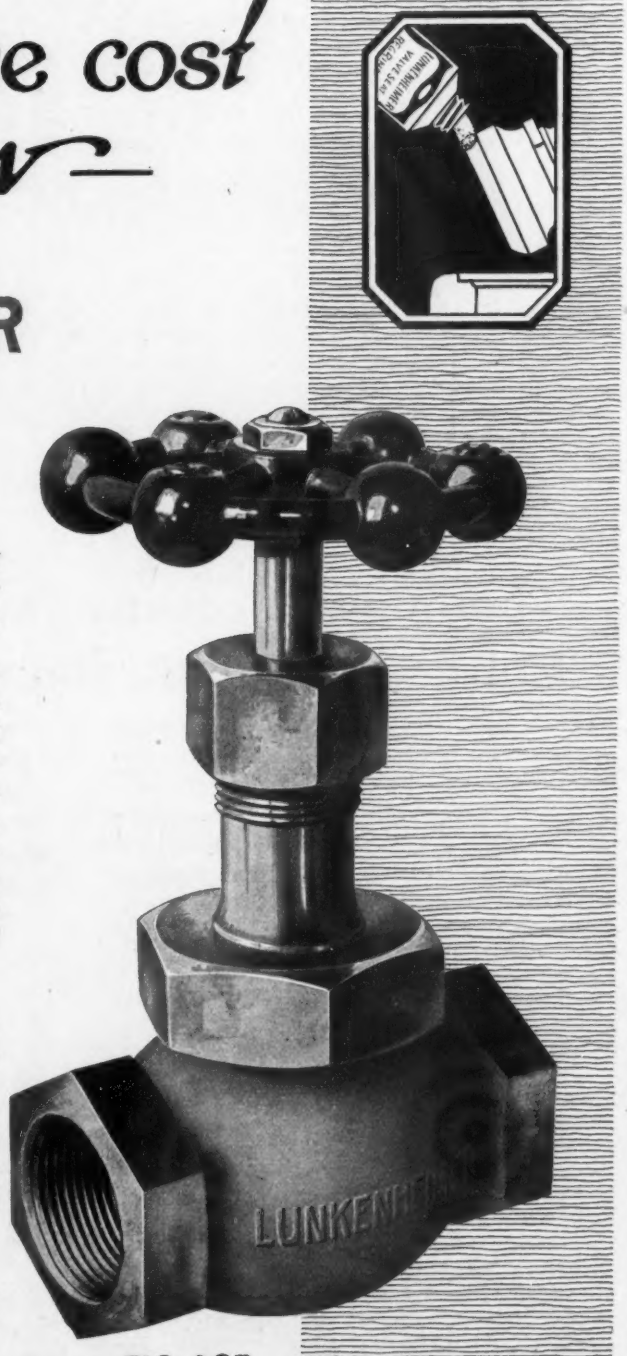


FIG 407

"America's Best since 1862"

THE LUNKENHEIMER CO.

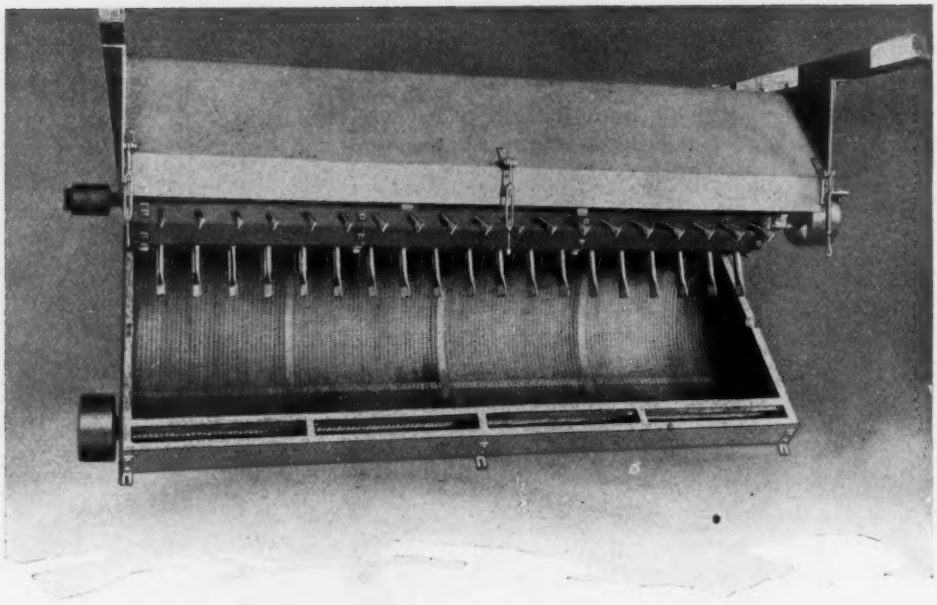
"QUALITY"

LARGEST MANUFACTURERS OF HIGH GRADE ENGINEERING SPECIALTIES IN THE WORLD

NEW YORK CHICAGO CINCINNATI, U.S.A. BOSTON LONDON

EXPORT DEPT. 129-135 LAFAYETTE ST., NEW YORK

3-25-10



Thoroughly Cleans and Aerates the Cotton Without Injuring the Fabric

The MURRAY Cotton Cleaning and Aerating Machine can be set into the cotton suction pipe between the opening room and the breaker pickers, and hung from the ceiling or other convenient support, making expensive special connecting arrangements unnecessary.

The opening machinery can be speeded up or slowed down to meet the requirements of the breaker pickers without altering the speed of the cleaner. The MURRAY takes care of itself. It has a working capacity of 25,000 pounds of cotton in a ten-hour day—more than any other cleaning machine on the market.

Being a horizontal machine it has no hidden bearings that can't be seen or given attention while the machine is in operation. Every bearing on the MURRAY is in plain sight and can be reached without stopping the machine.

Cylinder runs in ball bearings, completely eliminating friction.

Either belt or motor drive can be used.

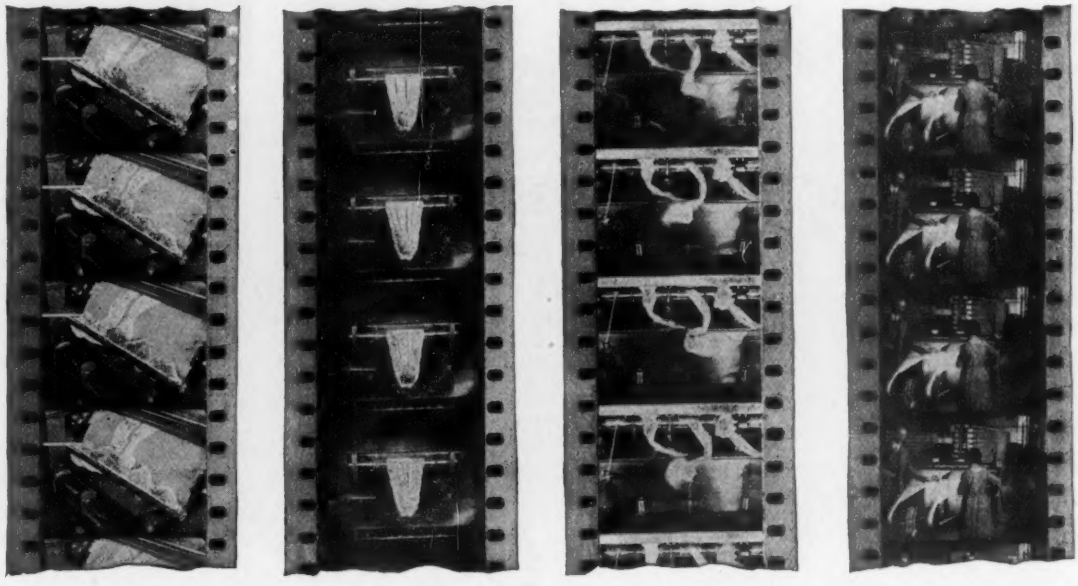
These are just a few of the many fine features of this perfect machine. We'd like to tell you more about it. Ask today for full data.

THE MURRAY COMPANY

ATLANTA, GA.

The Murray (PAT. PENDING)

COTTON CLEANING AND AERATING MACHINE



Seeing Thirsty Cotton with Movies

We've been telling you for some time of the loss from allowing your cotton to become thirsty.

All the manufacturing operations in a cotton mill tend to make it thirstier as it goes through until at the time of shipment its thirst may cost you as much as $5.00 a bale. Figures and charts are a cold medium of expression and we have long wished to be able to show in pictures just how and when these losses occur.

Through months of experiment and patient research work we are now able to announce the completion of a scientific film showing direct comparisons of good and bad conditions.

This film is entirely different from the usual industrial film. The pictures are taken close-up and by the ingenious slowing down process combined with magnification one can see the operation and behavior of the fibre during the different processes and just what effect moisture has.

Imagine being able to see a flyer that normally revolves at 900 revolutions per minute photographed as if it were running only 120 revolutions and showing all of the defects due to dry condition of the cotton in the sliver.

Magnification and the slow motion camera provide you with ten times as much eyesight, capable of seeing ten times as fast.

Subject to previous schedule, arrangements may be made to show the film in your locality. Write us.

Parks-Cramer Company

Engineers & Contractors

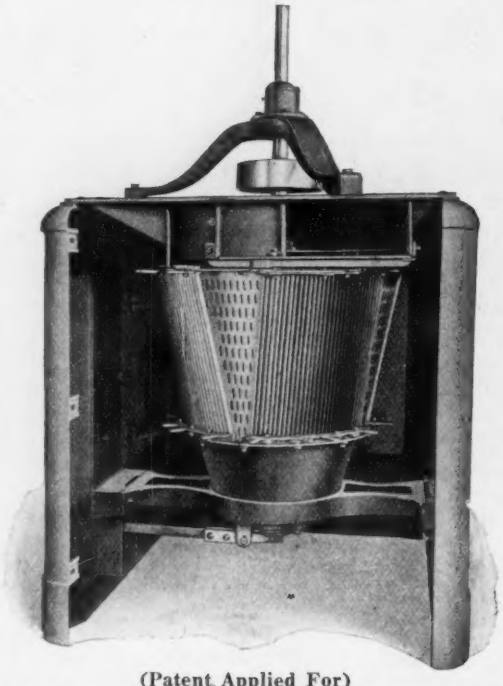
Industrial Piping and Air Conditioning

Fitchburg Boston Charlotte

Right Regain

Copyright 1922 P. C. Co.

SACO-LOWELL



(Patent Applied For)

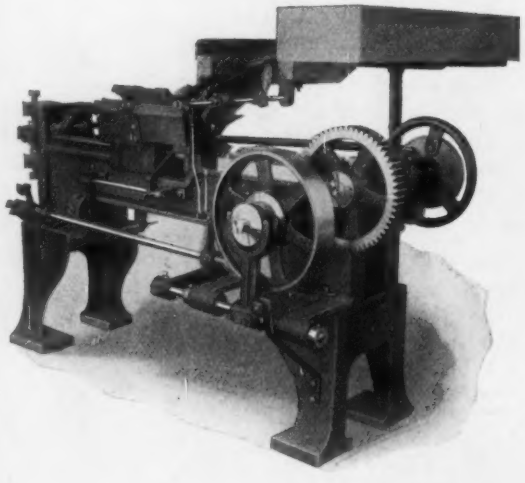
VERTICAL OPENERS

Showing the new style of Adjustable Grid Bars which improves both the quantity and quality of cleaning. A positive adjustment of the opening between these bars can be made so they can be adjusted to suit any grade of cotton used.

These bars are standard equipment on our new Vertical Openers.

SACO-LOWELL SHOPS

EXECUTIVE OFFICES, BOSTON, MASS.
ROGERS W. DAVIS, SOUTHERN AGENT,
CHARLOTTE, N. C.
SOUTHERN BRANCH OFFICE, GREENVILLE, S. C.



A NEW

BOBBIN STRIPPER

RUGGED AND EFFICIENT

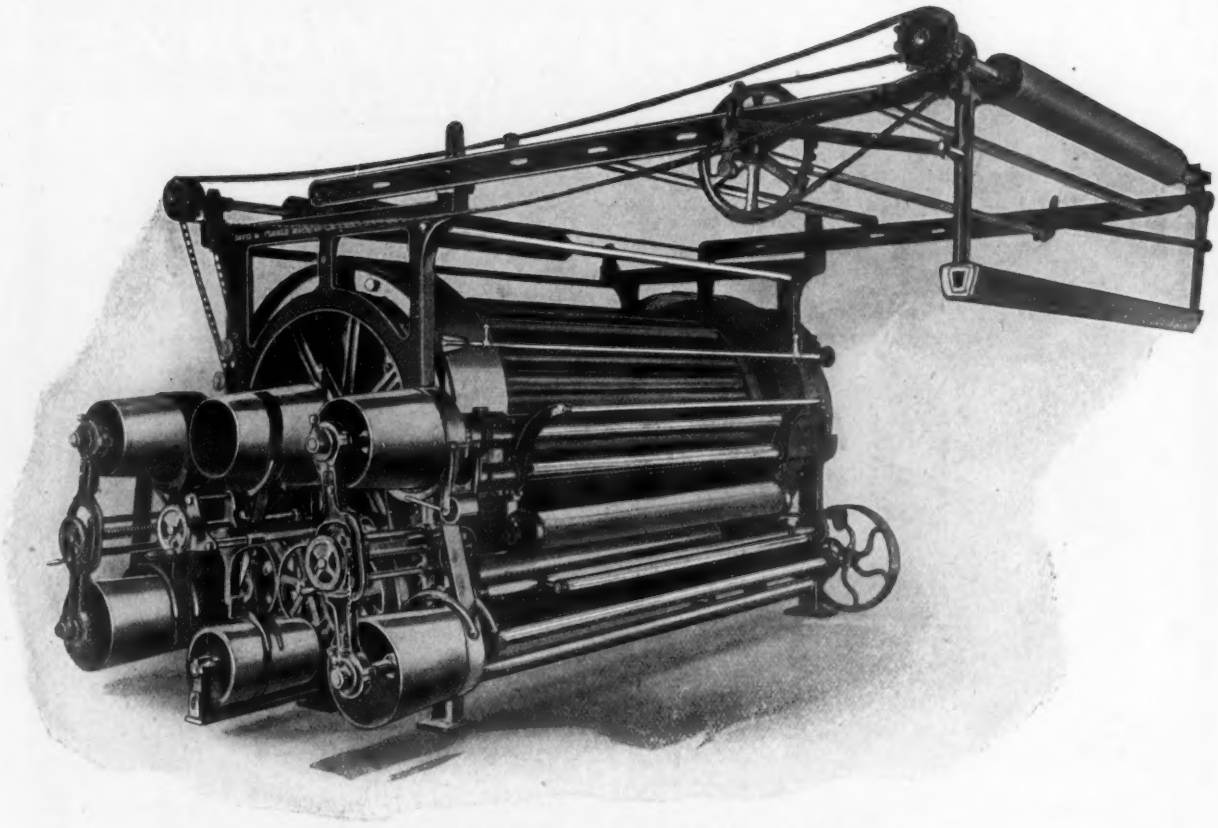
Submit Your Stripping Problem to Us.

Particulars and Pictures Sent on Request.

CROMPTON & KNOWLES LOOM WORKS

WORCESTER, MASS.

PROVIDENCE, R.I. PHILADELPHIA, PA. PATERSON, N. J.



36 ROLL DOUBLE ACTING NAPPER FOR COTTON GOODS

THE DAVIS & FURBER MACHINE CO.

OF NORTH ANDOVER, MASSACHUSETTS.

ESTABLISHED 1832

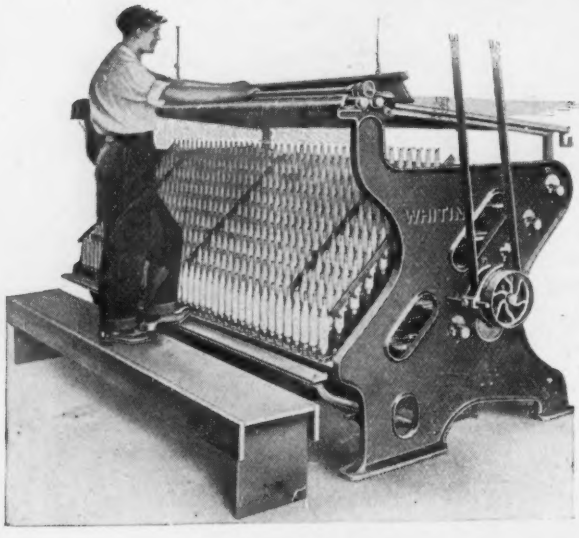
For 90 years manufacturing the highest type of Textile Machinery for Wool, Worsted, Cotton Waste, Jute, Mohair, Asbestos, Flax Waste, Silk Waste, and Shoddy.

Its Cards, Mules, Nappers, Pickers, Dusters, Tape Condensers, Dressing Machinery, Card Clothing and Napper Clothing are the standard for America and are constantly being exported.

WHITIN MACHINE WORKS

ESTABLISHED 1831

TEXTILE MACHINERY



Manufacturers of

LONG-CHAIN QUILTING MACHINES

for

Colored, Bleached and Mercerized Yarns

The Use of This Machine Insures:

First Quality in Production,
Increased Profits,
Reduced Labor Costs,
Savings in Power Consumption,
Economy in Floor Space.

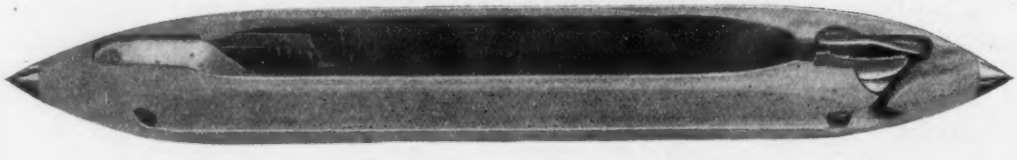
Full particulars on request.

MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE N.C.

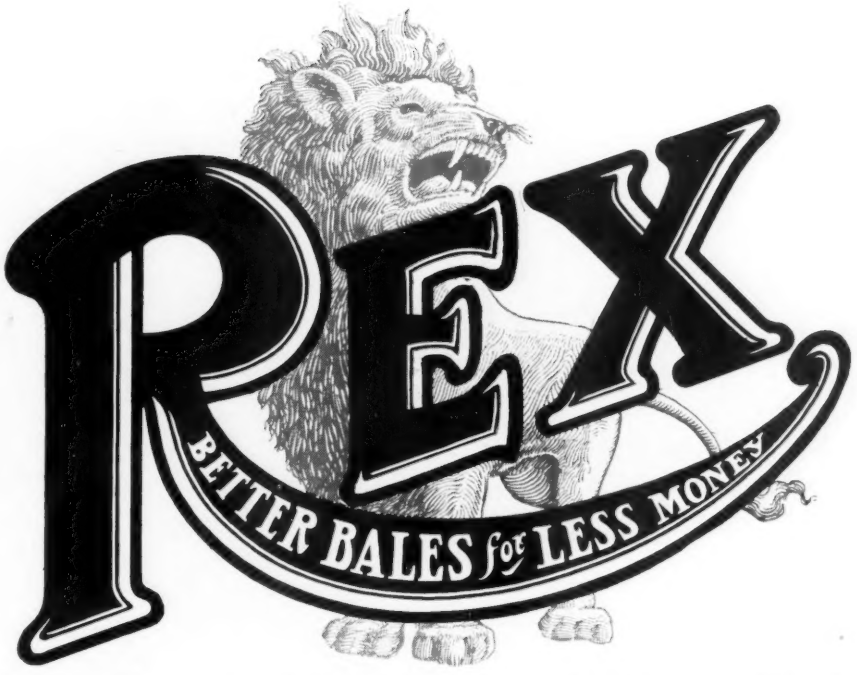
The J. H. WILLIAMS CO.



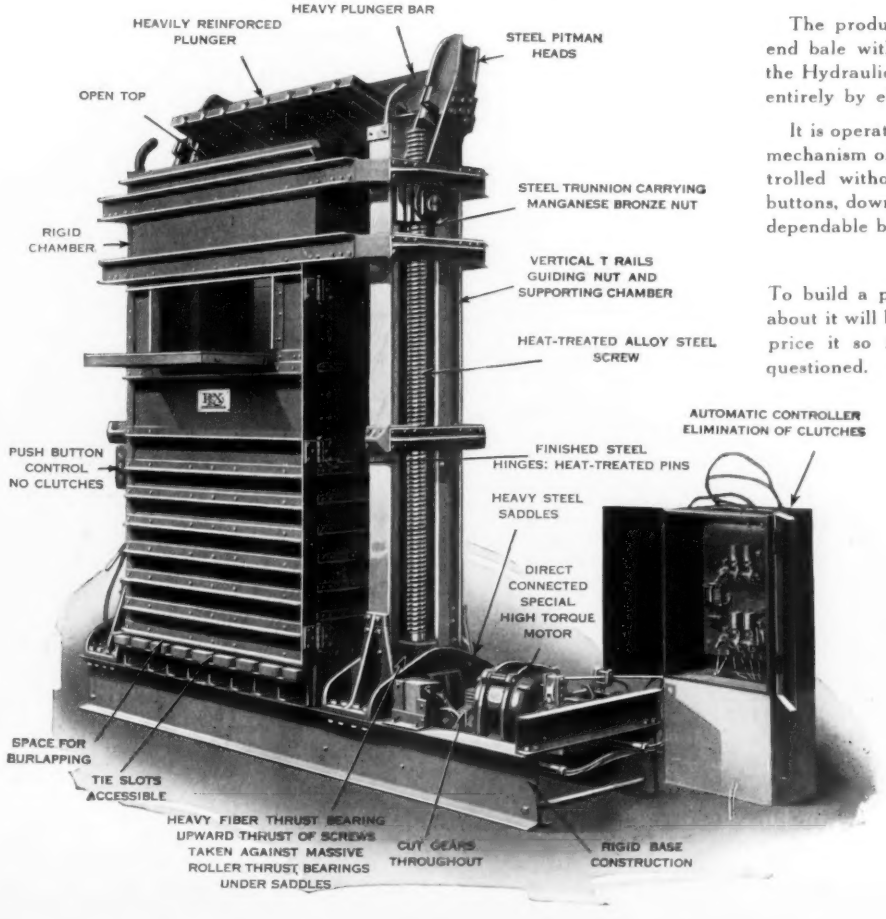
O. K. Automatic Shuttles
Wire Heddles, Heddle Frames

MILLBURY, MASS.

Geo. F. Bahan, Southern Representative.



Engineers and Practical Mill Men at the Greenville Exposition Acclaim "REX" the King of Balers


HEAVY PLUNGER BAR
HEAVILY REINFORCED PLUNGER
STEEL PITMAN HEADS
OPEN TOP
STEEL TRUNNION CARRYING MANGANESE BRONZE NUT
RIGID CHAMBER
VERTICAL T RAILS GUIDING NUT AND SUPPORTING CHAMBER
HEAT-TREATED ALLOY STEEL SCREW
AUTOMATIC CONTROLLER ELIMINATION OF CLUTCHES
PUSH BUTTON CONTROL NO CLUTCHES
FINISHED STEEL HINGES: HEAT-TREATED PINS
HEAVY STEEL SADDLES
DIRECT CONNECTED SPECIAL HIGH TORQUE MOTOR
SPACE FOR BURLAPPING
TIE SLOTS ACCESSIBLE
HEAVY FIBER THRUST BEARING UPWARD THRUST OF SCREWS TAKEN AGAINST MASSIVE ROLLER THRUST BEARINGS UNDER SADDLES
CUT GEARS THROUGHOUT
RIGID BASE CONSTRUCTION

The product of the "Rex" is a small square end bale with all the compact qualifications of the Hydraulic Press, yet the "Rex" is controlled entirely by electricity.

It is operated by a powerful double screw type mechanism of unique design and electrically controlled without clutches by three simple push buttons, down—up—stop. The fastest and most dependable baler on the market.

The Rex Creed

To build a press so good that the simple truth about it will be adequate recommendation and to price it so fairly that its value can never be questioned.

We unreservedly guarantee 100% satisfaction. Descriptive literature on request.

REX ENGINEERING CORPORATION

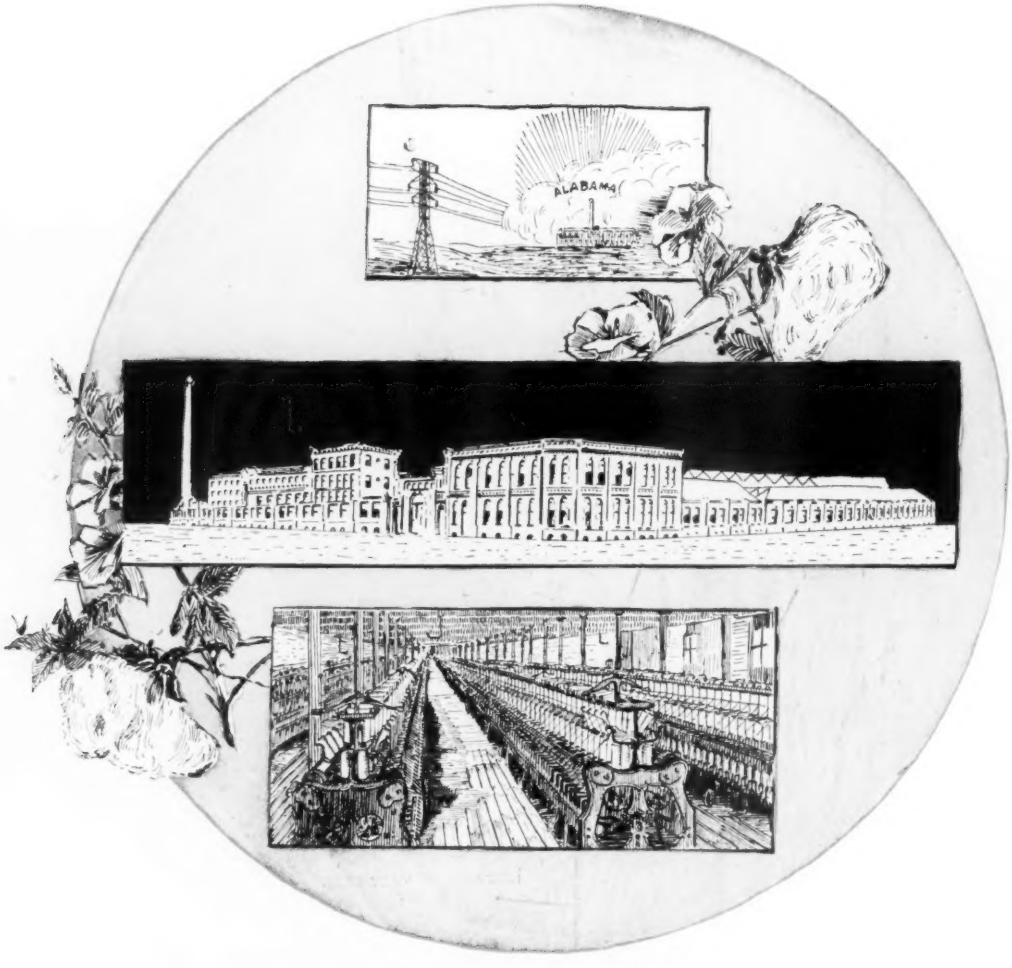
DUNKIRK, N. Y.

J. S. HULME

Southern Representative:
Atlanta Trust Co. Bldg.

ATLANTA, GA.

Textile Mills Pro



The best location for your individual requirements will be submitted by our Engineers upon request.

ALABAMA POWER CO.

BIRMINGHAM, ALA.

roper In Alabama

Because

Alabama offers advantages such as proximity to raw materials, favorable labor conditions, unequaled climate, available hydro-electric power in unlimited quantities.

Many sections of Alabama offer free mill sites for textile industries, and all sections offer full co-operation in establishing such industries.

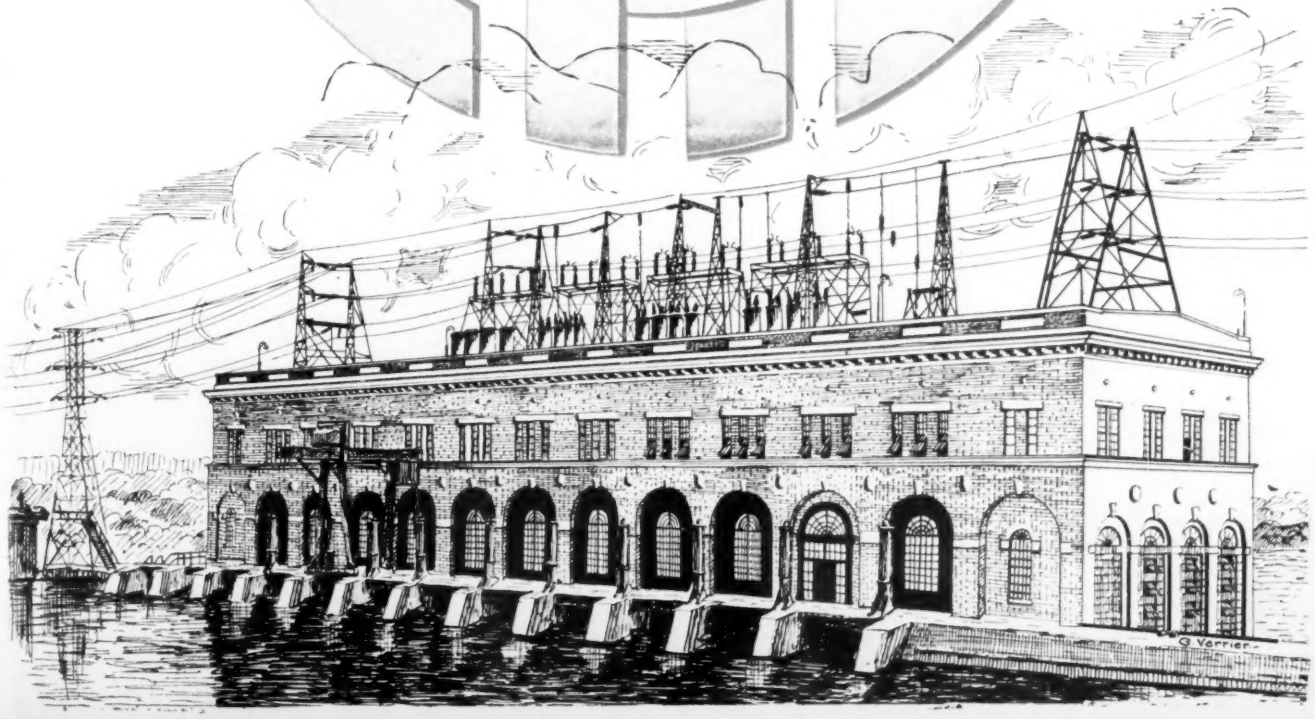
Three-quarters of a million bales of cotton were raised in Alabama in 1920, and large quantities were raised in adjacent states, which provides an adequate source of raw material.

A rural population of one and three-quarter million gives a source of reliable, capable and willing labor.

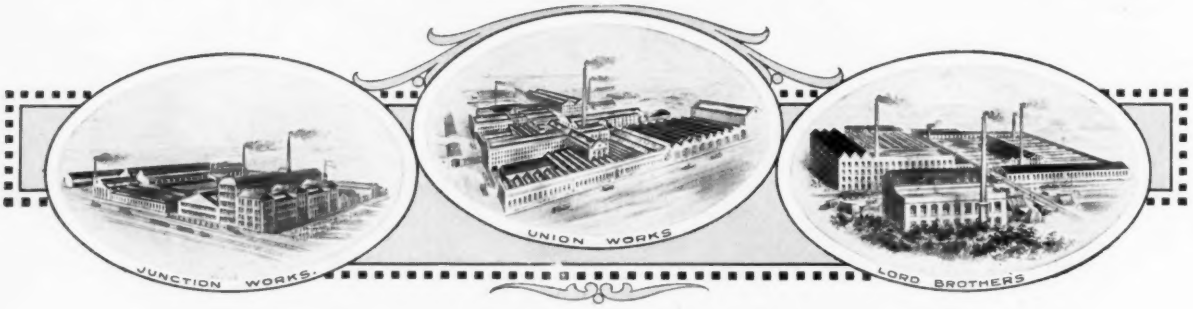
Climatic conditions are most favorable for industrial development.

Twenty-five thousand square miles of the state *are served* by the Alabama Power Company's system, which has ample generating capacity in hydro plants supplanted by large steam plants to serve all the present and future requirements of this territory.

Plan a visit to Alabama this fall so that you may fully realize the potential possibilities of Alabama as an industrial and manufacturing state.



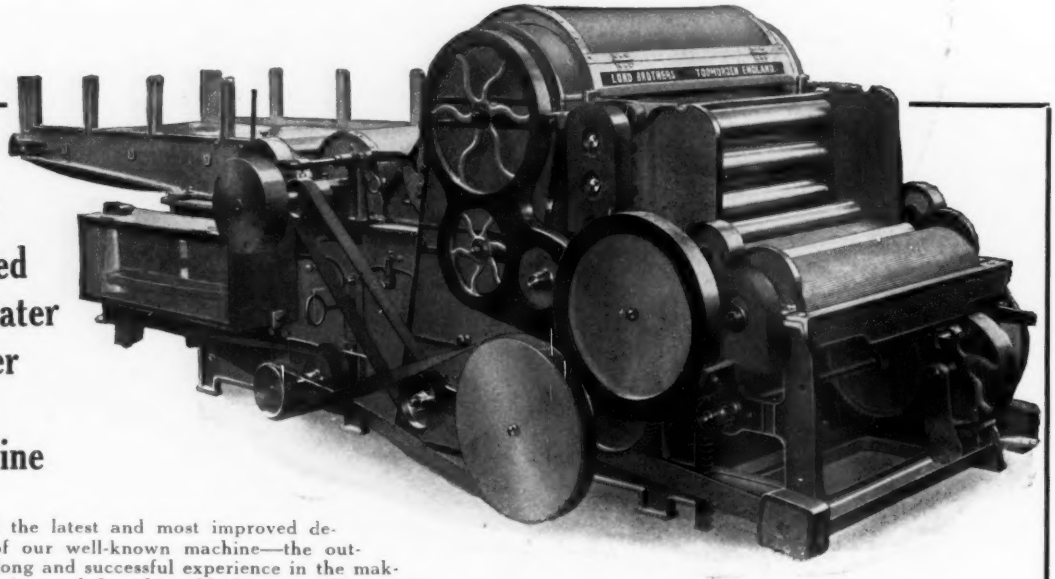
LORD BROTHERS



TEXTILE MACHINERY MAKERS

Waste Spinning Machinery a Specialty

Bale Openers for high-density and other Cotton Bales, Lattice Work, Hopper Feeders, Openers of various descriptions, and Scutchers for the treatment of Cotton and Cotton Waste.



Lord's Improved Single Beater Scutcher and Lap Machine

THIS is the latest and most improved design of our well-known machine—the outcome of a long and successful experience in the making of Opening and Scutching Machinery. While it is the lightest running Scutcher on the market, it is very strongly made and capable of the best possible Opening, Cleaning, and Regulating. We can specially adapt this Scutcher for Waste when required. It is made with Single Feed Roller and pedals (which give the best results) with pedal noses of various degrees of roundness to suit different staples of Cotton. Extra Feed Rollers may be added if desired.

Write for Descriptive Leaflet.

Manufacturers of Denims, Dungarees, Ticks and Regattas

CABLES:—"LORD'S Todmorden, Eng." **CODES:—A.B C. 5th, Bentley's A-1, Lieber's and Western Union (Universal)**

CANAL STREET WORKS, TODMORDEN, ENG.

INCORPORATED IN BROOKS & DOXEY (1920) LTD.

Close to the Heart of New England Industry

Among the many thousand depositors of National Shawmut Bank, there are not only representatives of every industry in New England, but many of *the leading firms in each line.*

With them the Shawmut Bank has kept step, serving well and thereby gaining strength to serve more. It is guided by the same spirit because most of its directors are the active heads of great New England enterprises.

Yet this institution is not exclusively devoted to the service of large customers. There is a cordial welcome here for the account of every well managed concern, regardless of size.

The customers of this bank all have the advantage of being in good company, and correspondents quickly appreciate the effective service rendered by *the bank that is closest to the heart of New England industry.*

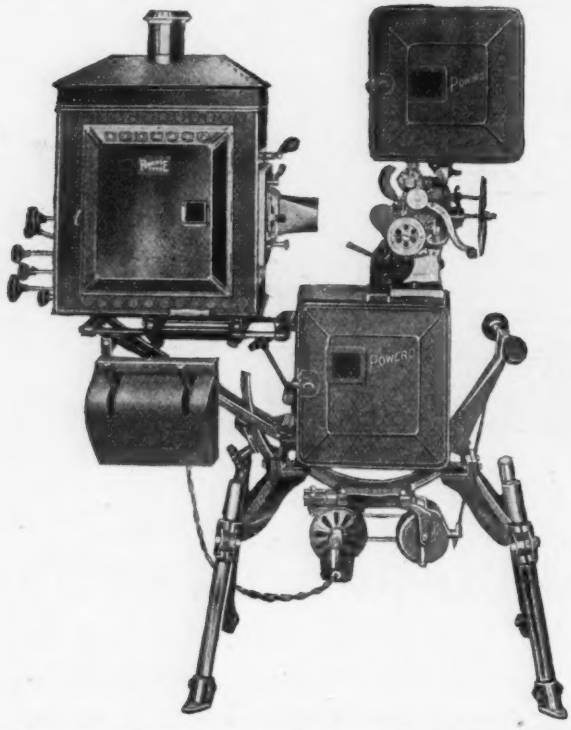
Capital and Surplus
$20,000,000

Correspondence is
cordially invited

THE NATIONAL SHAWMUT BANK *of* BOSTON

40 Water Street, Opposite the Post Office

Let Us Add Your Name To This List



OUR service to textile mills is the result of years of experience in installing textile theatre equipment. Our representatives call upon the mills personally, lay out the plans, advise on the proper equipment required and finally supervise the installation and the starting of the theatre. In other words, they take the whole problem off your hands and do not turn over the work to you until the theatre is operating satisfactorily.

The textile industry is demanding the best moving pictures for their employees and that is why they regularly specify POWER'S PROJECTORS.

That is why more Power's Projectors are used by textile mills in the South than all other projectors combined.

We carry a complete line of supply parts and equipment at our various branches. Your orders for supply parts will be filled the same day the order is received. Whatever are your needs for your theatre, we can supply them.

We have a special offer for Textile Mills. May we present it to you?

Satisfied Users of POWER'S PROJECTORS

ALABAMA

W. A. Handley Mfg. Co.	Roanoke
Tallassee Mills	Tallassee
Fairfax Mill	Fairfax
Avon Mills	Sylacauga
Lanett Cotton Mills	Lanett
Indian Head Mills	Cordova
Selma Mfg. Co.	Selma
Buck Creek Cotton Mills	Siluria

GEORGIA

Elm City Cotton Mills	LaGrange
Bibb Mfg. Co.	Porterdale
Roswell Mfg. Co.	Roswell
Gainesville Cotton Mill	Gainesville
Bibb Mfg. Co.	Columbus
Pacolet Mfg. Co.	New Holland
Manchester Cotton Mills	Manchester
Milstead Mfg. Co.	Milstead
Thomaston Cotton Mills	Thomaston
Exposition Cotton Mill	Atlanta
Habersham Mill	Habersham
Trion Company	Trion
Union Point Mfg. Co.	Union Point
Hillside Cotton Mill	LaGrange

NORTH CAROLINA

Durham Hosiery Mills	Durham
Pamona Mills	Greensboro
Cleveland Mill & Power Co.	Lawndale
Rodman-Heath Cotton Mills	Waxhaw
Rocky Mount Mills	Rocky Mount
Cherokee Falls Mfg. Co.	Cherokee Falls
Roxboro Cotton Mills	Roxboro
Consolidated Textile Corp.	Burlington
Carolina Cotton & Woolen Mills	Spray
Erwin Cotton Mills	Duke
Cannon Manufacturing Co.	Kannapolis

SOUTH CAROLINA

Baldwin Cotton Mills	Chester
Tucapau Mills	Tucapau
Ware Shoals Mfg. Co.	Ware Shoals
Glenn-Lowry Mfg. Co.	Whitmire
Monaghan Mills	Greenville
Drayton Mills	Spartanburg
Victor Mills	Greer
Conestee Mills	Conestee
Kershaw Cotton Mills	Kershaw
Abbeville Cotton Mills	Abbeville
Chesnee Mills	Chesnee
Union-Buffalo Mills	Buffalo
Victor-Monaghan Mills	Seneca
Victor-Monaghan Mills	Jonesville
Pacolet Mfg. Co.	Pacolet
Aragon Mills	Rockhill
Graniteville Mfg. Co.	Vancluse
Woodside Cotton Mills	Greenville
Orr Cotton Mills	Anderson
Issaqueena Mills	Central
Clifton Mfg. Co.	Clifton
D. E. Converse Co.	Glendale
Winnsboro Mills	Winnsboro
Monarch Mills	Lockhart
Republic Cotton Mills	Great Falls

Southern Theatre Equipment Company

WILLIAM OLDKNOW, President.

No. Nine Nassau St.
ATLANTA, GEORGIA

THREE TWENTY-EIGHT CALIFORNIA ST.,
OKLAHOMA CITY, OKLA.

Eighteen Fifteen Main St.
DALLAS, TEXAS

Fleet of three White heavy duty trucks in the service of Cooper & Griffin, Inc., Greenville, S. C.

White Trucks

The *faith* truck owners have in White equipment! Of the large fleet owners 105 have invested over $100,000 each in White Trucks:

36	over	$ 250,000 each
16	over	500,000 each
10	over	1,000,000 each
3	over	2,000,000 each
1	over	3,000,000

Experienced users *know* truck value. They continue to purchase White Trucks year after year.

THE WHITE COMPANY
Cleveland

21 YEARS OF KNOWING HOW

Catalogs

Stuffers

Booklets

Display Cards

Stickers

General Office Literature

All forms of Special Advertising Literature

Illustrated Price Lists

Folders

Boxes

Illustrations of Plants

Machinery

Portraits

Factory Products

Homes

Let Us

Visualize Your Ideas

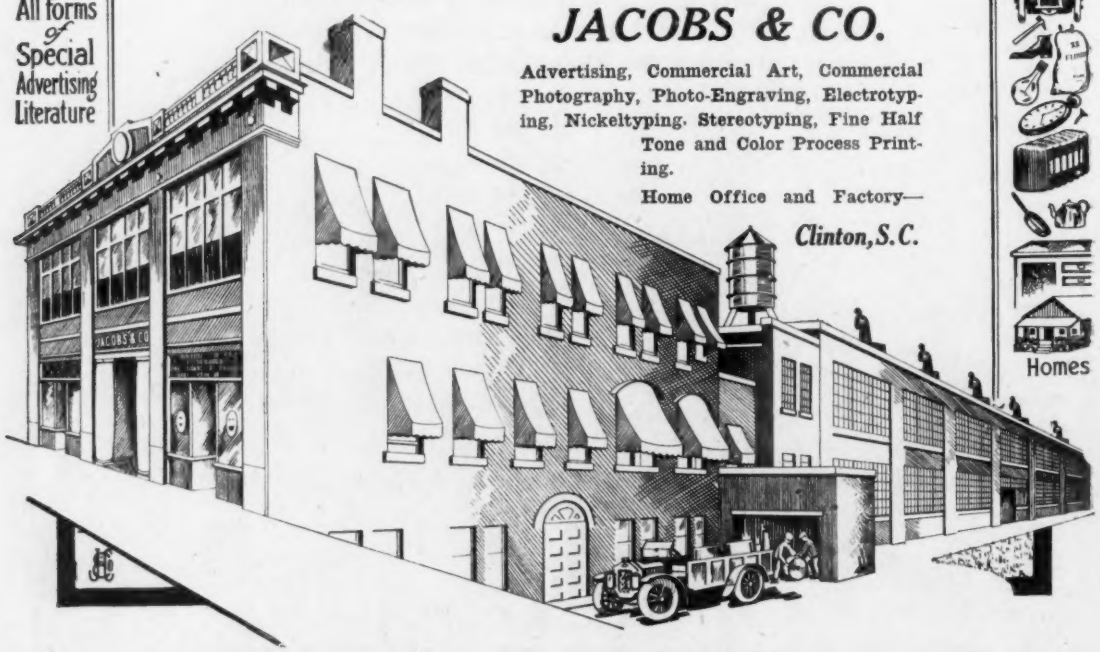
Most wide-a-wake business men are constantly originating ideas, sales and advertising plans, which, if carried into execution, would be the means of producing improved business and greater sales.

Possibly you have the ideas which you have failed to use, the lack of technical knowledge covering advertising and publicity plans alone discouraging you.

Our occupation for over 23 years has been that of the crystalization of publicity plans for others. With a thoroughly equipped, most complete plant furnishing "anything and everything for the advertiser" we can carry your ideas into practical and successful execution.

May be it is a trade-mark, a slogan, literature or some special form of illustration, or perhaps it is a long needed treatise or exposition of your plant, your product, your service. Whatever it is, our artists, ad-writers, engravers, electrotypers, printers,—in short, our advertising experts —will gladly carry your ideas into execution and further improve them by the production of new ideas, the conception of better expression and of new thought.

Whatever your problem is, write us.

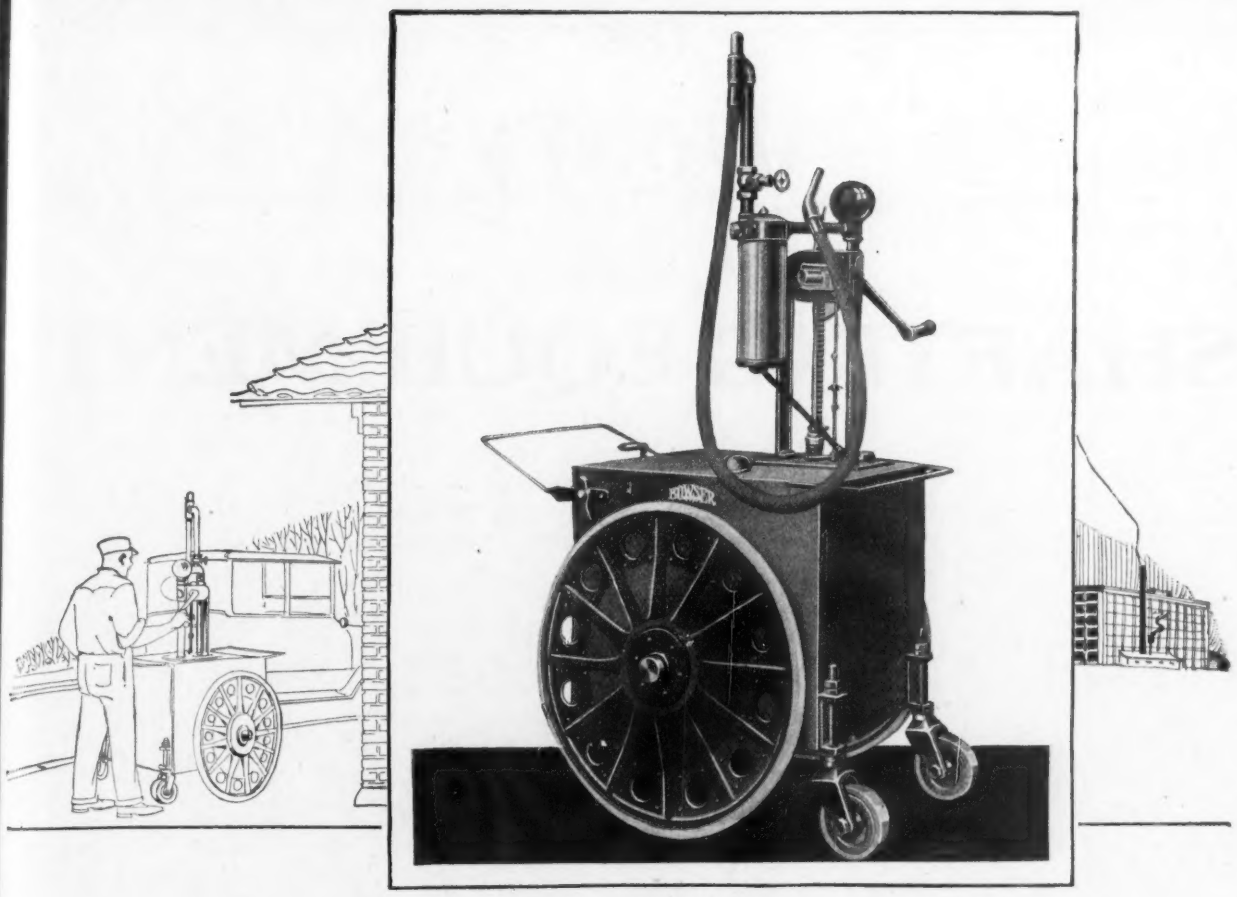


JACOBS & CO.

Advertising, Commercial Art, Commercial Photography, Photo-Engraving, Electrotyping, Nickeltyping. Stereotyping, Fine Half Tone and Color Process Printing.

Home Office and Factory—

Clinton, S.C.



Gasoline *Quickly* Available

Gasoline carried around the shop in open measures is dangerous. Moreover, this practice is wasteful, for much of the gasoline is lost by evaporation and spilling.

The Bowser Portable Wheel Tank is evaporation proof. No fumes can escape, so, the fire hazard is eliminated. The outfit is easily moved to the point of most convenient service.

The Bowser piston-type pump accurately measures the exact quantity needed. Workmen's time and steps are saved.

Booklet A-45 tells how hundreds of other plants have cut down overhead and increased plant efficiency with Bowser equipment. Write for it today.

Bowser Products
For Handling Gasoline and Oils Wherever Sold or Used

Filling Station Pumps and Tanks for Gasoline.
Portable Tanks for Oil and Gasoline.
Storage and Measuring Outfits for Paint Oils, Kerosene and Lubricating Oils.
Carload Oil Storage Tanks.
Power Pumps.
Dry Cleaners' Underground Naptha Clarifying Systems.
Richardson-Phenix Oil Circulating and Filtering Systems and Force Feed Lubricators.

Write for Booklet

S. F. BOWSER & CO., Inc.

Pioneer Manufacturers of Self-Measuring Pumps

Home Plant: Fort Wayne, Indiana

Canadian Plant: Toronto, Ontario

Factories and Warehouses: Albany, Dallas, Milwaukee, San Francisco, Sydney

District and Sales Offices: Albany, Atlanta, Baltimore, Boston, Buffalo, Chicago, Cleveland, Columbus, Dallas, Denver, Detroit, Kansas City, Los Angeles, Minneapolis, New York, Oklahoma City, Philadelphia, Pittsburgh, Portland, St. Louis, San Francisco, Toronto, Washington.

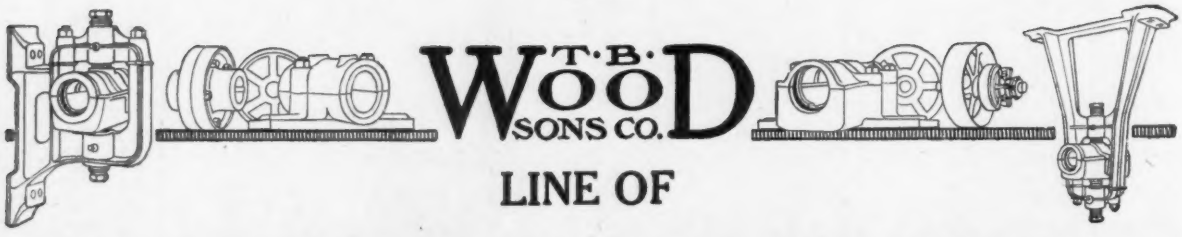
Representatives Everywhere.

Branch Offices, with Service Departments, in Principal Cities in this Country and Abroad

BOWSER ESTABLISHED 1885

ACCURATE MEASURING PUMPS

THE



LINE OF

SHAFTING EQUIPMENT

can be depended upon to deliver the maximum amount of power from its source to the machines with a minimum amount of frictional loss.

Every article in the line has been scientifically designed to obtain greatest strength and give the most effective service without carrying excessive weight; which would add nothing but needless expense to the user.

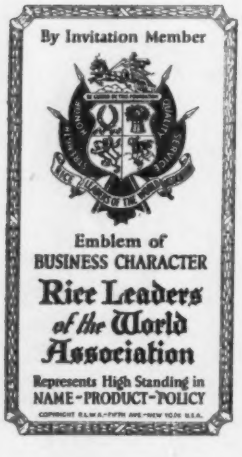
We are well qualified to speak and act authoritatively on this subject from the fact we have never devoted our energies or attention to any other products, except as they may affect or be affected by "Power Transmission Appliances."

Our Engineers are capable of giving worth-while expert information as to the proper equipment for each particular drive. And our modern plant is prepared to manufacture any device you and these engineers may decide upon.

Whether for a single appliance
or a complete installation,

consult

T. B. WOOD'S SONS CO.
CHAMBERSBURG,
PENNA.



MILTON G. SMITH, SOUTHERN SALES AGENT, GREENVILLE, S. C.

POWER TRANSMITTING MACHINERY

Millions of Gallons of TEXACO lubricants are used today

MILLIONS of gallons of TEXACO LUBRICANTS are used today in mills, power plants, factories, on railroads, in steamships, and in mines.

Back of our widespread production resources, mammoth Texaco refineries and capable delivery service are working night and day to supply the oil needs of a steadily increasing number of new customers in all parts of the world.

TEXACO DOESN'T OFTEN LOSE A CUSTOMER

The suitability of Texaco Lubricants, their quality, their uniformity,—in barrel after barrel, month after month, these things cannot fail to commend them to all interested in securing the right oil for the right place.

The success of Texaco Lubricants is bound up with Texaco Lubrication Engineering Service. This consists of giving our customers the benefit of the experience of our staff of highly trained lubrication specialists. As a matter of fact, even before we take your order we shall be glad to have a Texaco Lubrication Engineer make a survey of your plant; after which he will indicate the right kind and the right amount of lubricant for every type of unit or machine—in every department.

Texaco Lubricants are stocked in over 600 Texaco Warehouses in all parts of the country; and are ready for shipment in any quantity,—tank car, barrel or car; by water, rail or truck with Texaco promptness.

If there should be no warehouse or Texaco Station in your city, write us here, or address our nearest district office and your oil requirements will be promptly and fully cared for.

COUPON

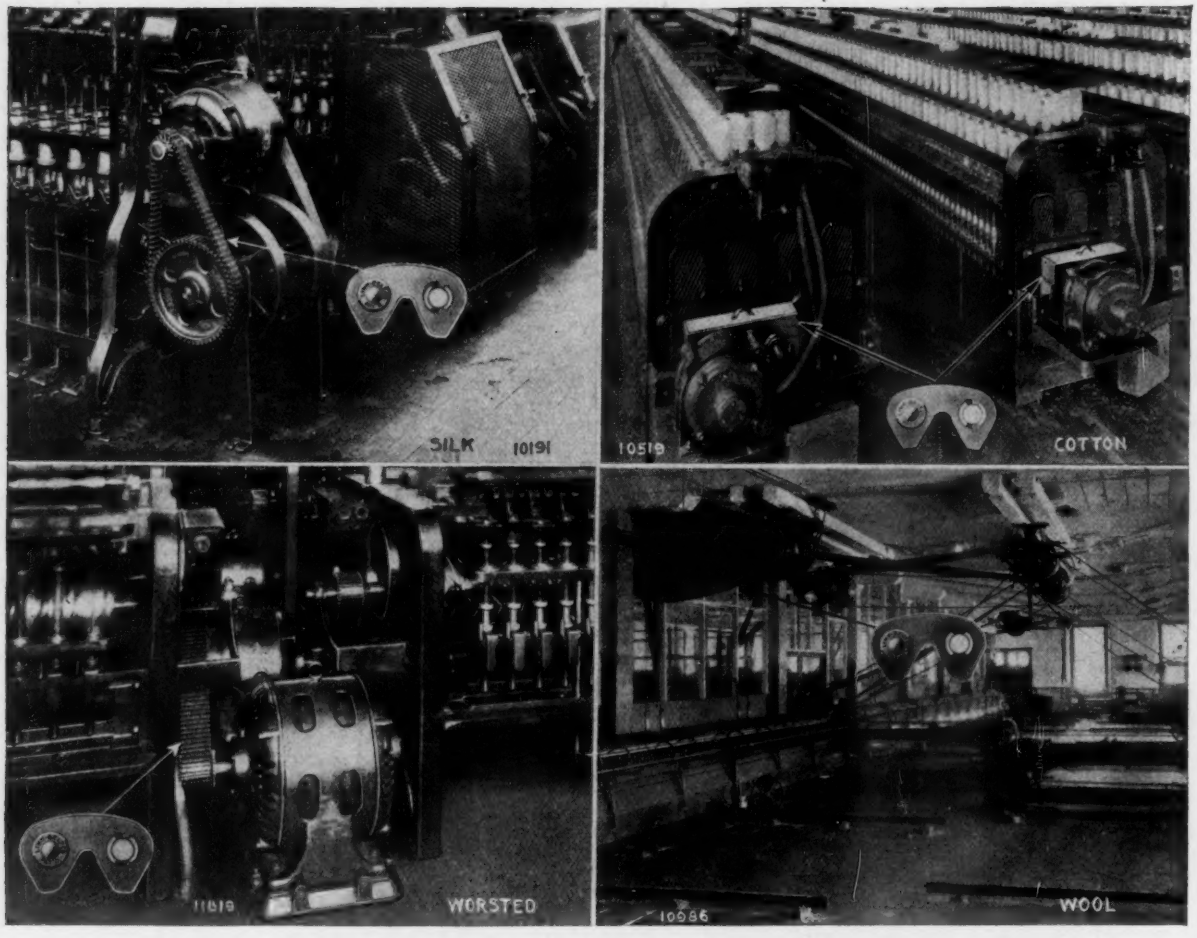
Do you want to become a free subscriber to our magazine "Lubrication?" Published monthly by us and devoted exclusively to the scientific selection and use of lubricants. Fill out this coupon and mail to

THE TEXAS COMPANY
Texaco Petroleum Products
Dept. O, 17 Battery Place, New York City
Sold the world over

Name _____ *Street* _____

City _____ *State* _____

11-22



THE UNIVERSAL DRIVE FOR SPINNING MACHINERY

THE universal application of Link-Belt Silent Chain to all types of spinning machinery is the best evidence of its effectiveness in this class of work.

No matter what the type of spinning machinery — whether for cotton, silk, worsted, wool or even asbestos — Link-Belt Silent Chain has shown some very definite advantages.

In all of these methods and materials it provides a highly satisfactory drive, combining the advantages of quietness, compactness, high efficiency, durability, and maintaining maximum production with uniform quality.

In addition to spinning machinery the application of Link-Belt Silent Chain to practically all types of textile machinery is rapidly superseding the older and inefficient forms of transmission — on looms, drawing frames, twisting frames, spoolers, warpers, winders, cards, ribbonlap and sliverlap machines, lineshafts, bobbin strippers, finisher cards, breaker cards, garnett machines, garnett pickers, grinders, pumps, etc.

Let one of our power transmission specialists on textile transmissions look over your mill and show you how Link-Belt Silent Chain can improve power transmission throughout your entire mill.

1054

LINK-BELT COMPANY

PHILADELPHIA — CHICAGO — INDIANAPOLIS

New York - - Woolworth Bldg.
Boston 9 - - - 49 Federal St.
Pittsburgh - - 1501 Park Bldg.
St. Louis - - Central Nat'l Bank Bldg.
Buffalo - - - 547 Ellicott Square
Wilkes-Barre - - 2d Nat'l Bank Bldg.
Huntington, W. Va - Robson-Prichard Bldg.
Cleveland - - - 429 Kirby Bldg.
Detroit - - - 4210 Woodward Ave.
Kansas City, Mo. - - 306 Elmhurst Bldg.
Seattle - - - 820 First Ave., S.
Portland, Ore. - - - 101 First St.
San Francisco - - - 168 Second St.
Los Angeles - - 163 N. Los Angeles St.
Denver Lindroth, Shubert & Co., Boston Bldg.
Louisville, Ky. - - F. Weble, Starks Bldg.
New Orleans C. O. Hinz, 604 Carondelet Bldg.
Birmingham, Ala. S. L. Morrow, 720 Brown-Marx Bldg.
Charlotte, N. C., J. S. Cothran, Com'l Bank Bldg.

Canadian Link-Belt Co., Ltd., Toronto and Montreal — H. W. CALDWELL & SON CO., CHICAGO — NEW YORK, Woolworth Bldg. — DALLAS, TEXAS, 709 Main St.

LINK-BELT
SILENT CHAIN DRIVES

Established 1854 *Incorporated 1898*

THE A. & F. BROWN CO.

ENGINEERS, FOUNDERS AND MACHINISTS

Engineering and Sales Office, 79 Barclay Street, New York

Works
Elizabethport, N. J.

POWER TRANSMISSION SPECIALISTS

Stock Room in
New York City

The worst and most prevalent leak in manufacturing and power plants is due to poorly designed and cheaply made Power Transmission Machinery.

Our specialty is designing, building and, if desired, erecting Power Transmission Machinery of a quality superior to the commercial grade in order to prevent leakage due to break-downs and excessive friction.

The Original Double Braced Adjustable Hanger with F. Brown's Patented Metallic Wick Self-Oiler

(Copied by many but never equalled)

This oiler will not clog or glaze and the freedom of the feed maintains a film of oil between shaft and bearing. The shaft runs in oil.
Many of these hangers have been in constant use for 30 to 40 years without rebabbitting and still in good condition. Where there is friction there is wear. When the wear is not appreciable there cannot be much friction.

F. Brown's Patent Friction Clutch Couplings and Pulleys, etc.

Designed for high speed and heavy loads. Durable, simple, few parts, no springs.

F. Brown's Patent Self-Acting Siren

as used on U. S. Navy vessels and army transports that carried our soldiers "over there."

Adopted and installed after competitive tests by the Committee of Safety, as an alarm in case of an aerial attack on New York City during the war. By the U. S. and many foreign lighthouse departments as a fog signal. By towns, oil refineries and large manufacturing plants as a fire and riot alarm.

Also made to operate by compressed air.

Ball Color Mixers

For mixing and secondary grinding of dyes, chemicals, colors, etc. Contains 5 balls 3" to 5" diam., according to size of globe.

Newman Patent Continuous Service Foot Valve

No stoppage for cleaning. Outer screen is raised above surface to clean and lowered again. Circular scraper (on upper screen) cleans inner screen of any deposit accumulated while upper screen was raised.

ECONOMY is where quality determines the price, not where price controls the quality.

Catalogue on request.

THE ROCKER JOINT SILENT CHAIN WITH CENTER GUIDE LINKS

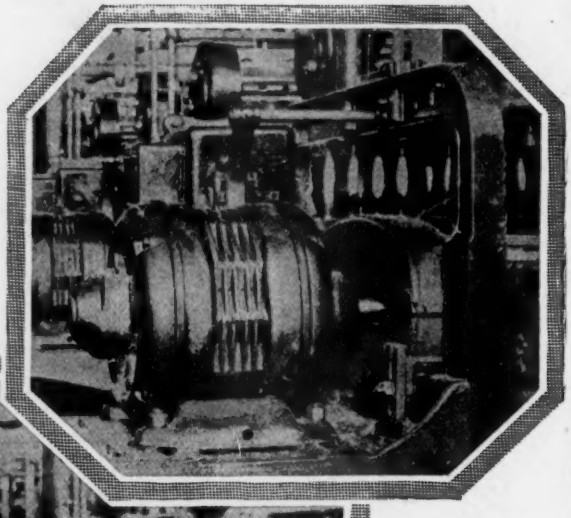
Flexible as a Belt *Positive as Gears*

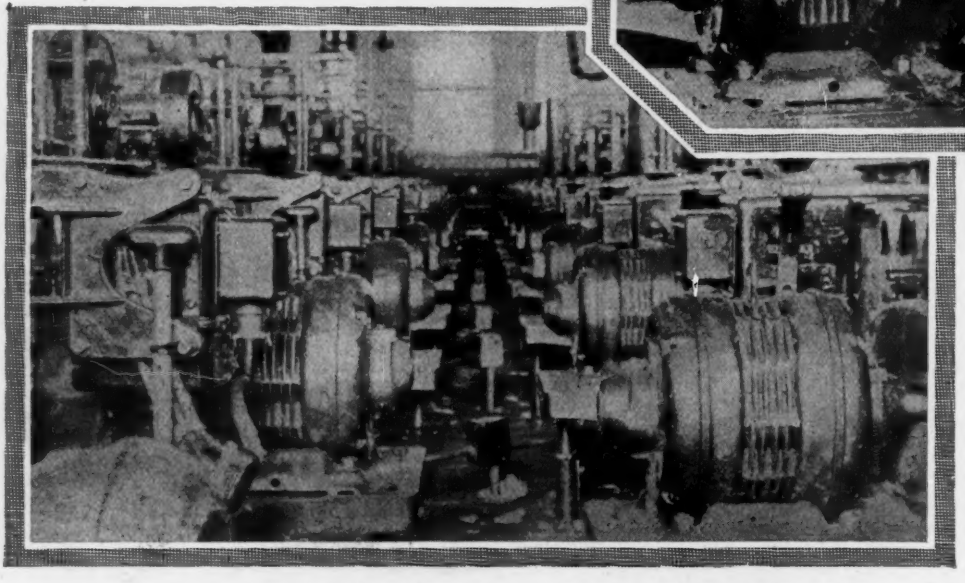
MORSE DRIVES

SILENT CHAIN — THE MORSE "ROCKER JOINT"

ON SPINNING FRAME DRIVES

RUN COOL, OIL BATHS NOT REQUIRED
SMOOTH RUNNING IMPROVING QUALITY
ANY REDUCTION IN SPEED IS POSSIBLE
FREEDOM FROM OVERHEAD CONSTRUCTION
GUIDE LINKS HOLD CHAIN ON LINE
UNIFORM SPEED, INCREASING PRODUCTION
CLEANLINESS—CONGENIAL WORKING SURROUNDINGS





WITHOUT SLIP
DURABLE
POSITIVE SPEED RATIOS
OPERATES QUIETLY
BETTER LIGHTING
BETTER PLANT LAYOUT

Lynchburg Cotton Mill Co., Lynchburg, Va., Lockwood, Greene & Co., Engineers.

SAVE Construction, Space, Light, Fuel, Producing More With Less. Engineers Planning Power Transmissions Secure Data and Estimates of "MORSE" Drives.

Write Today for Booklet

MORSE CHAIN CO., LARGEST MANUFACTURERS OF SILENT CHAINS IN THE WORLD **ITHACA, N. Y.**

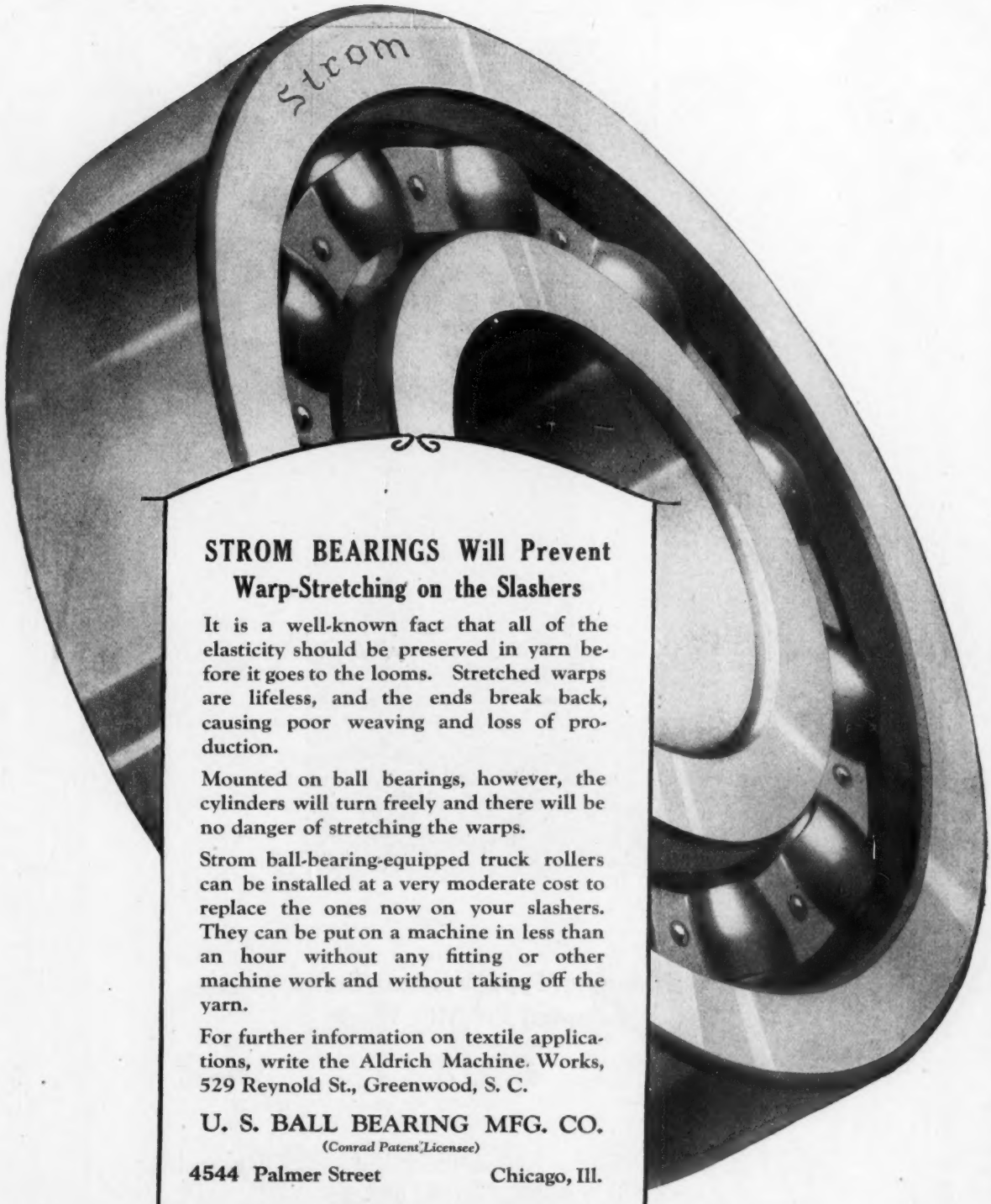
Morse Engineering Service. *Benefit by Morse Service as others do.* *Assistance Without Obligation*

Address Nearest Office

ATLANTA, GA.....702 Candler Bldg., Earl F. Scott & Co.
BALTIMORE, MD.....1402 Lexington Bldg.
BOSTON, MASS.....141 Milk St.
CHARLOTTE, N. C.....404 Commercial Bank Bldg.
CHICAGO, ILL.....Merchants L. & T. Bldg.
CLEVELAND, OHIO.....Engineers Bldg.
DETROIT, MICH.....1361 Abbott Street
KANSAS CITY, MO.....Finance Bldg., Morse Eng'rg Co.
NEW YORK CITY.....30 Church St.
PHILADELPHIA, PA.....612 Franklin Trust Bldg.
.....18-22 South 15th Street
MINNEAPOLIS, MINN....So. 3rd St., Strong-Scott Mfg. Co.
PITTSBURGH, PA.....Westinghouse Bldg.
SAN FRANCISCO, CAL.....Monadnock Bldg.
ST. LOUIS, MO.....Chemical Bldg., Morse Eng'rg Co.
MONTREAL.....St. Nicholas Bldg., Jones & Glassco Reg'd
TORONTO...Bank of Hamilton Bldg., Jones & Glassco Reg'd
WINNIPEG, MAN.....Dufferin St., Strong-Scott Mfg. Co.

MORSE CHAIN COMPANY ITHACA, NEW YORK

"Morse" is the Guarantee Always Behind the Efficiency, Durability and Service



STROM BEARINGS Will Prevent Warp-Stretching on the Slashers

It is a well-known fact that all of the elasticity should be preserved in yarn before it goes to the looms. Stretched warps are lifeless, and the ends break back, causing poor weaving and loss of production.

Mounted on ball bearings, however, the cylinders will turn freely and there will be no danger of stretching the warps.

Strom ball-bearing-equipped truck rollers can be installed at a very moderate cost to replace the ones now on your slashers. They can be put on a machine in less than an hour without any fitting or other machine work and without taking off the yarn.

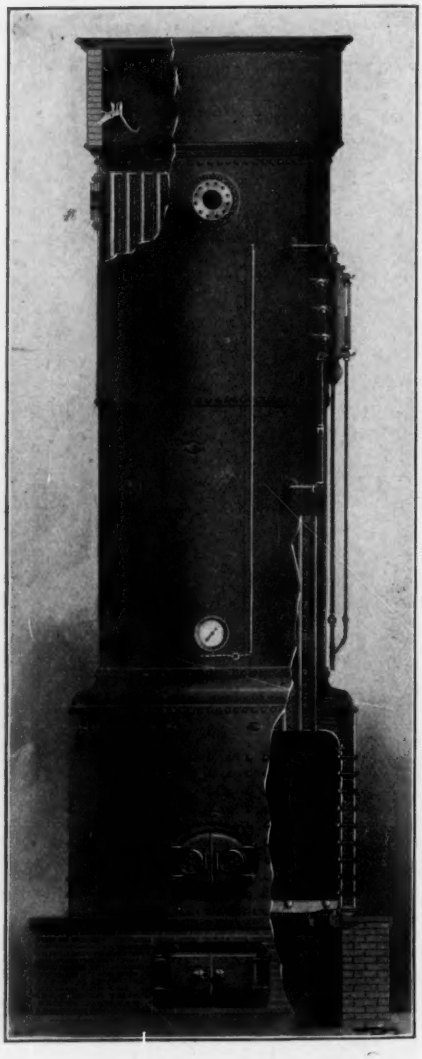
For further information on textile applications, write the Aldrich Machine Works, 529 Reynold St., Greenwood, S. C.

U. S. BALL BEARING MFG. CO.
(Conrad Patent Licensee)

4544 Palmer Street **Chicago, Ill.**

Strom BEARINGS

"Wherever a Shaft Turns"



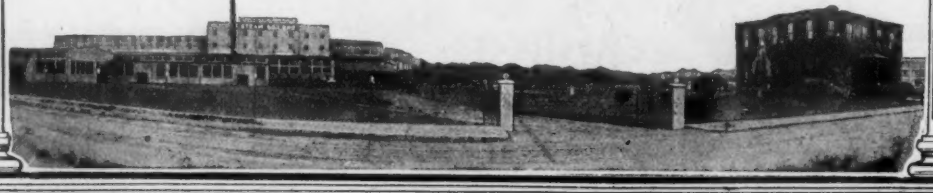
Manning Type Vertical Boiler
Adapted for Mill Work

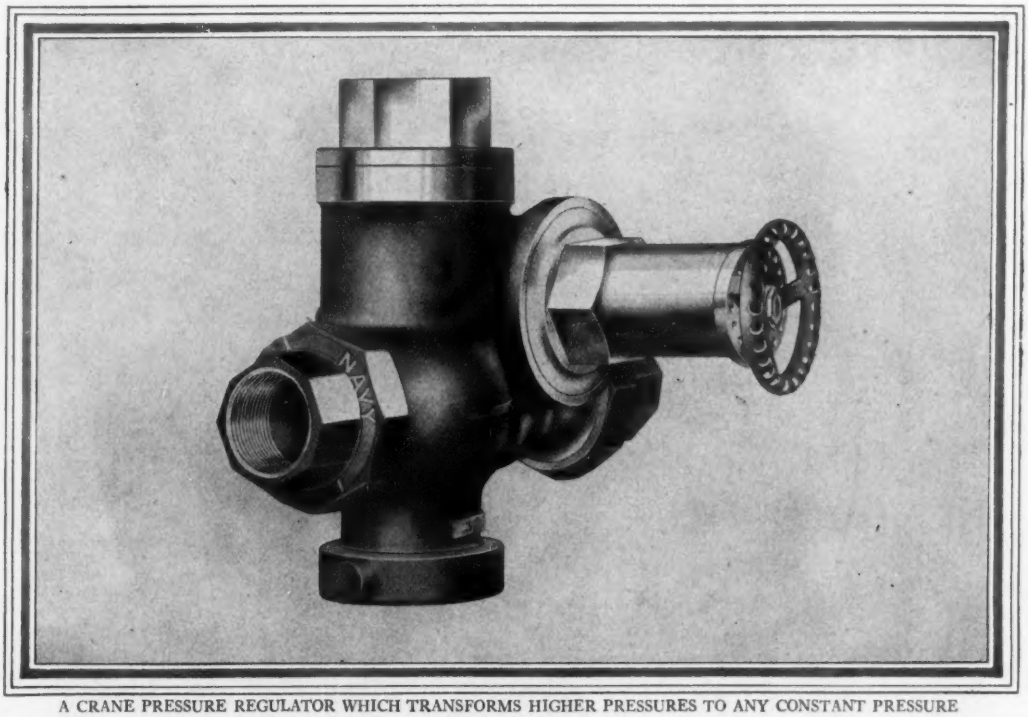
INTERNATIONAL ENGINEERING WORKS, Inc.
FRAMINGHAM, MASS.

Southern Representative,
Isaac Hardeman, Charlotte, N. C.

BOSTON
PHILADELPHIA

NEW YORK
SAN FRANCISCO





A CRANE PRESSURE REGULATOR WHICH TRANSFORMS HIGHER PRESSURES TO ANY CONSTANT PRESSURE

INCREASING THE UTILITY OF A PLANT

Low pressure steam or air delivery direct from higher pressure mains and constant pressure delivery are possible with Crane pressure regulators. Steam at the correct pressure for small power units or low pressure heating, constant pressure steam for process heating and air for blasts, heaters, and low pressure tools can be taken from higher pressure mains through this automatic valve without loss of one bit of heat or energy. Crane pressure regulators are furnished with unions or flanged connections, for any reasonable capacity and working pressure. Let the Crane representative help you to increase the utility of your distribution piping with this dependable money-saving specialty.

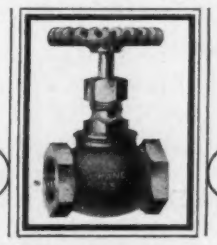
CRANE

GENERAL OFFICES: CRANE BUILDING, 836 S. MICHIGAN AVE., CHICAGO

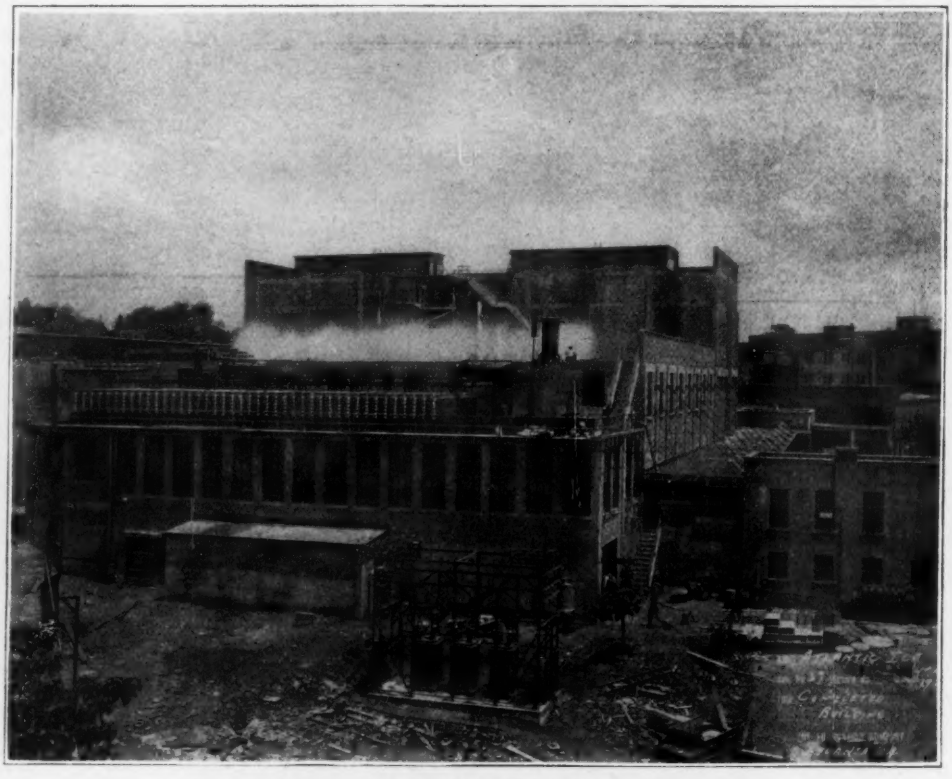
Branches and Sales Offices in One Hundred and Thirty-five Cities

National Exhibit Rooms: Chicago, New York, Atlantic City

Works: Chicago and Bridgeport



Crane 75 Low Pressure Globe Valve



West End Plant---Atlantic Ice & Coal Corp., Atlanta, Ga.
Morgan & Dillon Architects.

This modern and well equipped Ice plant was completed in record time by one of our experienced and efficient organizations.

THE FOUNDATION COMPANY

CONTRACTORS AND ENGINEERS

ATLANTA

NEW YORK	SAN FRANCISCO	MONTREAL, CANADA
NEW ORLEANS	LOS ANGELES	PARIS, FRANCE
CHICAGO	PHOENIX	LIMA, PERU
PITTSBURGH	PORTLAND, ORE.	HAVANA, CUBA
DETROIT	VANCOUVER, B. C.	TAMPICO, MEXICO

BUILDERS OF **SUPERSTRUCTURES** AS WELL AS **SUBSTRUCTURES**

THE FUNCTIONS OF THE ENGINEER

The Need for Finishing Plants

AN UNFINISHED or partially finished product from a textile mill calls for the services of another manufacturer to complete the process before the goods can be put on the market.

It is not always expedient nor often advisable for every textile mill to add a finishing department. The output of one mill may not justify the investment, but a group of mills may easily support such a finishing plant to their own profit.

A finishing plant established in a locality adjacent to a number of mills of average capacity can be made of mutual profit to operator and customer alike, through economies of time, freight and service.

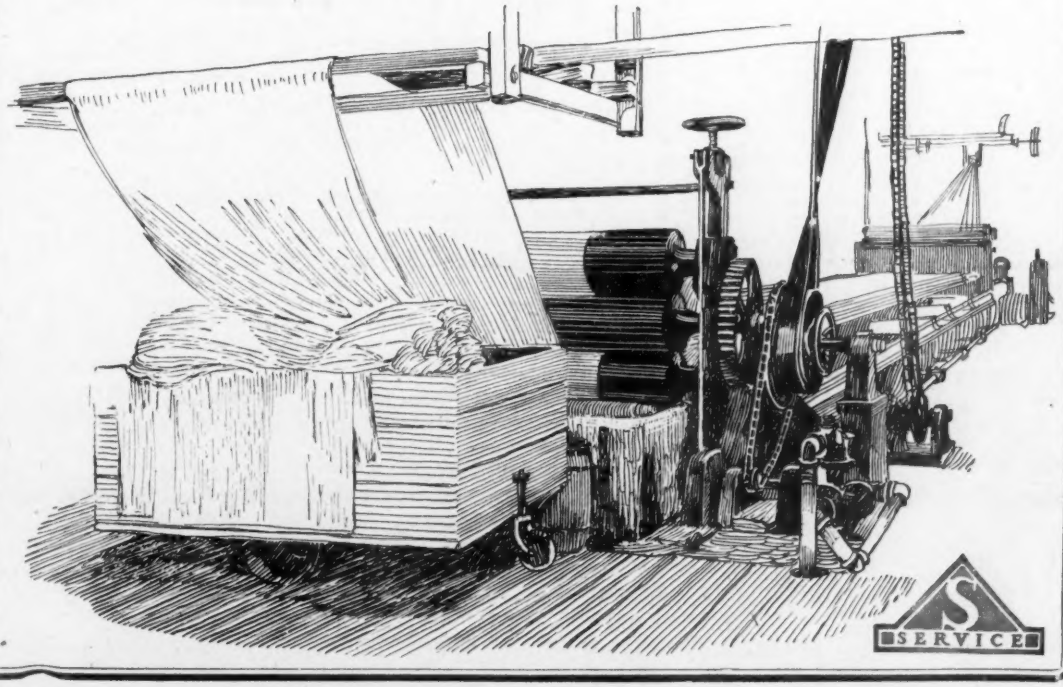
There are many localities where a finishing plant would develop a profitable market for its service.

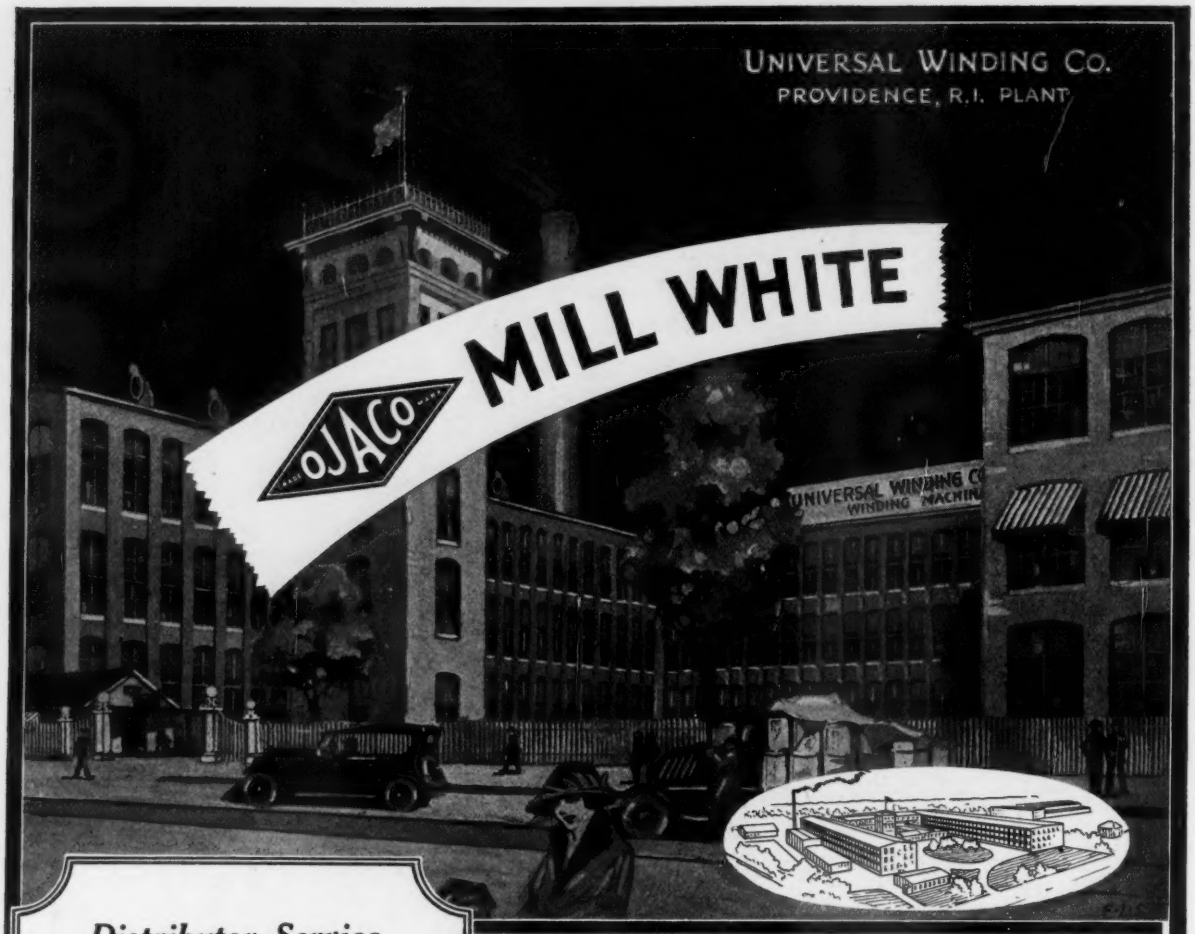
This is a phase of the Textile Industry to which this organization of Engineers has devoted much study and in which it has had a sound experience.

A discussion will entail no obligation and may prove highly profitable.

J. E. SIRRINE & COMPANY

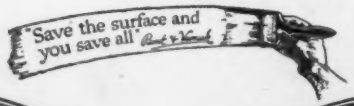
Greenville *Engineers* **South Carolina**





Distributor Service

ATLANTA, GA.
Robert G. Barr & Co.
BOSTON, MASS.
Lewis E. Tracy Co.
CHARLOTTE, N. C.
Charlotte Supply Co.
FALL RIVER, MASS.
Wm. F. Harticon
HOLYOKE, MASS.
J. Russell & Co.
ROCHESER, N. Y.
F. P. Van Hosen Co.
SYRACUSE, N. Y.
Alexander Grant's Sons & Co.
UTICA, N. Y.
American Hard Wall Plaster Co.
WOONSOCKET, R. I.
J. B. Farnum Co.



The "Universal" Way

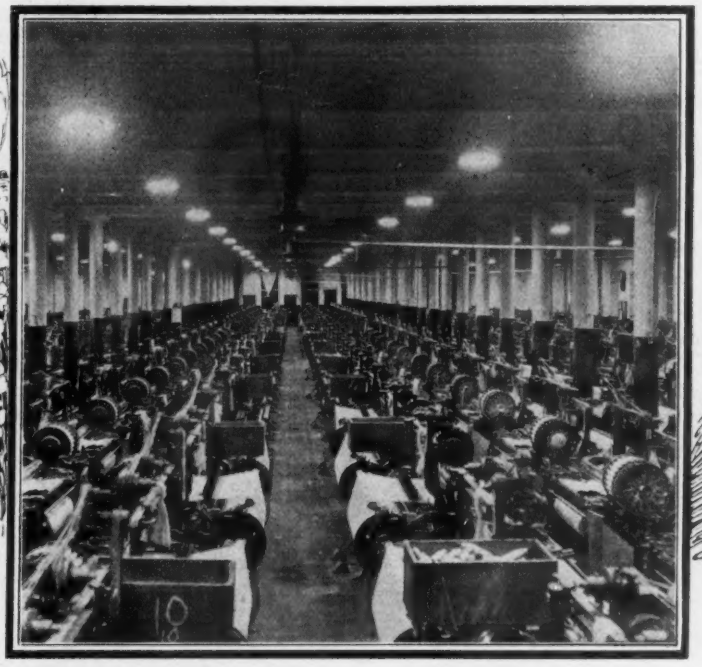
WHERE a world-wide reputation for fine craftsmanship is even partly dependent upon the workers' vision, every ray of light must be used—and magnified.

Knowing this, the Universal Winding Company—makers of machines that increase production and improve the quality of filling yarn for weaving—enlisted the aid of OJACO Mill White.

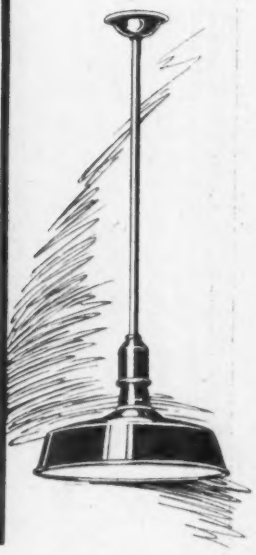
Walls and ceilings of this Company's mammoth plant now *reflect*, rather than absorb, the rays of sun and artificial lighting. A permanent, washable, snowy-white finish improves the light of the entire working area.

You can obtain the same results with OJACO Mill White—whether your plant is large or small. Ask the nearest OJACO distributor for convincing proof.

Oliver Johnson & Co., Inc.
Paint Makers Since 1833
PROVIDENCE, R. I.



An installation of IVANHOE RLM reflectors and bowl-enameled lamps in the weave room of a southern cotton mill. From an unretouched photograph.



Spoilage and Production Curves!

Down in South Carolina a large textile mill installed modern lighting, using IVANHOE RLM reflectors and bowl-enameled MAZDA lamps. When the good lighting installation had been in operation for only two weeks, the plant superintendent checked up on the investment. And this is what he found—

First, he discovered that his minimum spoilage curve had been ironed out flat. Secondly, he found that the valleys in his production curve had been filled. His losses due to poor lighting on rainy and cloudy days had been practically eliminated. And his records for two years past, during which time his plant employed poor lighting, told him just when such days had occurred. Obviously this superintendent is enthusiastic about IVANHOE lighting service.

This experience is not at all unique, for good textile mill lighting does increase production and decrease spoilage. It also enables workmen to see when machines are running idle—betters employee morale—makes possible proper plant sanitation—and prevents many minor accidents. Scores of mill executives have demonstrated these advantages of good lighting to their own satisfaction in their own plants.

How is the lighting in your own plant? Is it inadequate and expensive? Or is it adequate and economical? Near you is an IVANHOE distributor who will be glad to advise you without charge and without obligation on your part. See him at once, or write to us direct.

IVANHOE-REGENT WORKS of General Electric Co.
Cleveland, Ohio

"Ivanhoe" Steel Reflectors Lighting Glassware, Anderson Self-Adjusting Arms, and Illuminating Service.

"SERVICE TO LAMPS"

IVANHOE

GLASS SHADES - STEEL REFLECTORS

NATIONAL U.S.A. DYES

BUFFALO PLANT

GENERAL OFFICES, NEW YORK

MARCUS HOOK PLANT

Dependability

An outstanding requirement of color consuming industries is a dependable source of supply.

Large manufacturing facilities not only make possible the production of a wide and diversified line of dyes, but by creating ample stocks afford a dependable supply to the consumer when he wants it.

The dyestuff user can, therefore, plan his work with perfect confidence that his needs will be supplied promptly with dyes of an established standard.

National Aniline and Chemical Company, Inc.

New York *Chicago* *Charlotte* *Toronto* *Philadelphia*
Boston *Hartford* *Montreal* *Providence* *San Francisco*

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor. **R. W. PHILIP, Associate Editor.**

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 per year; Canada, $1.50 a year; Foreign, $2.00 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The name of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

Member Associated Business Papers, Inc.

Volume 87 **Member Audit Bureau of Circulation.** No. 1

CONTENTS

EDITORIAL—

Congress and Its Unfinished Work..... 3

The Responsibility of Leadership 4

GENERAL AND TECHNICAL—

Determining Costs in a Cotton Mill..... 5

Southern Textile Association 9

Southern Textile Exposition 20

South Carolina Mill Men Meet..... 21

Metal Partitions for Industrial Plants..... 23

The Design and Manufacture of Fustians..... 25

Sodium Peroxide as a Bleaching Agent..... 29

What the Southern Mills Are Doing..... 31

The New England Mill Situation..... 34

Cotton Comment 36

Notes About Men You Know..... 40

An Old-Timer Says 43

HOW OTHER MEN MANAGE—

Even Work on Pickers and Cards..... 45

Cloth Defects and Their Classification..... 47

A Discussion on Fly Frames..... 47

To Stop a Speeder From Running Under..... 49

What Causes Shedding in Weaving?..... 51

Mixing, Opening and Picking..... 53

Applied Harness Cam Design..... 55

A Correction 61

Taking Hold on a New Job..... 61

Points on Spinning 63

The Employment Manager 65

Good Carding 69

KNITTING SECTION—

Checked Styles in Knitted Fabric..... 73

Among the Knitting Mills..... 76

The Knit Goods Market 79

The Yarn Market 85

Open Price Custom May Be Revived..... 87

The Pepperell Manufacturing Company, Biddeford, Me., is now operating twenty new Hyatt equipped broad looms built for them by the Hopedale Manufacturing Company.

By specifying that these 90″ sheeting looms be equipped with Hyatt bearings the Pepperell Mills have insured dependable operation, a worth while power saving, easy turning by hand and materially decreased lubrication costs.

As Hyatt equipped *narrow* looms have shown a power saving of 23.4%, it is only logical to expect that the power saving on these *broad* looms will be even greater.

Many other textile manufacturers are also realizing the advantages of Hyatt bearings and hundreds of additional Hyatt bearing looms are now being built, many more broad looms being included.

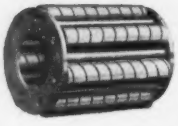
At small cost you can have Hyatt bearings built into your new looms. Can you longer afford to be without them?

Hyatt Roller Bearing Co., New York, N. Y.

Industrial Bearings Div., N. Y. Tractor Bearings Div., Chicago
Motor Bearings Div., Detroit Pacific Coast Div., San Francisco

USE HYATT BEARINGS ON YOUR LINE SHAFTS TOO BULLETIN 127

Twenty
New
Hyatt Bearing
Broad Looms
At Work



For
Better Spinning and Weaving
Use
Hyatt Roller Bearings

With the Publishers

Capitalizing Curiosity

A Yankee showman who had toured India with Sandow and operated a roller skating rink in Australia, once took a flyer on the China Coast with a chute-the-chutes outfit. The Chinese public fairly mobbed the walled inclosure where the attraction was set up; they came early and stayed late—but not to ride. They paid admission just to see the empty boats come down.

This showman was capitalizing curiosity.

Those makers of equipment who broadcast their advertising to millions of people, without discriminating as to class, are also attempting to capitalize curiosity. They know that the millions pay the five or ten cents admission fee to the magazines in question to be entertained. They hope to attract to their products, from among those millions of persons, the attention of a sufficient number to pay suitable returns on their investment in advertising space. Perhaps they succeed in some instances and with some products, but the majority fail to achieve the end sought because of one principal psychological reason that stands out from the many subsidiary reasons like a lighthouse on a promontory—these millions of people read such magazines to gratify their desire for entertainment. Like the Chinese public, they pay the price of admission, but refuse to ride in the boats.

P. T. Barnum, conceded to be the greatest curiosity capitalizer this country has ever produced, and who coined a well known catch phrase because of his success, was always careful never to "buck" the simple psychology of the situation. He amused his public and thrilled them, but he never attempted to preach to them.

A busy cotton mill manager may go to the circus, the theatre or a baseball game for amusement, but he neither expects nor desires to listen to an instructive lecture on cotton preparation between the acts or between the innings. He also goes to church, but if his pastor attempted to expatiate on the advantages of some particular make of mill equipment between hymns, on the chance that he or some other manufacturer might be present and could be sold on the idea, this pastor would find himself at least sadly mistaken and possibly looked upon as a harmless lunatic.

Manufacturers desiring to learn the details about certain manufacturing processes, or seeking information on the advantages of certain types of equipment for their factories, always consult the magazines specializing on their particular business lines. Such men would no more think of consulting the pages of a popular magazine when in need of technical advice or information than would a botanist seeking facts on phytology, or a physician investigating the latest methods of anaesthesia. As our British brother would say, "It just isn't done, don't you know."

Sales managers doubting the truthfulness of the foregoing statements might invite a prospect to an interesting "movie" and then try to put over their selling talk while the pictures are being shown. The prospect is only using his eyes—his ears are idle. Anyway, the experiment won't cost as much to try out as broadcasted advertising and the sales managers will have the advantage of knowing they are talking to an actual prospect, which is so seldom the case in broadcasted effort as to be pitiful.

AMONG COTTON'S READERS

Harry Richardson, Superintendent,
Aldrich Brothers Company,
Cotton Manufacturers
Moosup, Conn.

"Do not let my subscription to COTTON run out, as I do not know of any textile magazine, anywhere, that is more interesting to me than COTTON."

Harry Richardson

November, Nineteen-Twenty-Two

Congress and Its Unfinished Work.

The shortness of the final session of the Sixty-Seventh Congress is a good or bad circumstance depending on the nature of what is done between the first Monday in December and March 3. It may be the last session of Congress until the regular time for the new Congress to meet in December, 1923. That, however, is unlikely as special sessions, in recent times, have become the rule instead of the exception. Only once since the special session called by President Taft in 1909 has Congress enjoyed to the full the long vacation between the ending of the work of one Congress and the time fixed by the Constitution for the work of the next: That was in 1915, when Congress was inactive between March 3, when the old went out, and December 6 when the new one assembled. Other interims between sessions have been only occasional and brief holidays, the longest one during the last six years occurring in 1916 when Congress was adjourned sine die for about three months.

Thus during the last fifteen years Congress has been an almost continuously operating body. Prior to the beginning of this period it was in session less than one-half of the time. Also prior to the last fifteen years, the final short session of a Congress generally was of no big importance, as rarely was anything done beyond the passing of the annual supply bills.

Despite the increased volume of work done by Congress in recent years, there remains for the short session of the sixty-seventh organization of that body a calendar of unfinished business that is both lengthy and important. It cannot be fully cleared up, but yet much may be done. And what is done should be watched even more carefully than is the case with respect to the transactions of long sessions. For it is apt to be done in undue hurry; and the circumstances overhanging Congress during a final short session of a term are materially different from those prevailing at other times. A Congressional election will have just occurred. Whatever changes in Congressional personnel resulting from it do not become effective until the new Congress is organized, which may be more than a year after the election. The old Congress, however treated at the polls, still will possess very important power and responsibility. This probably may be a defect in our national legislative system; but whether defect or advantage it is of peculiar potency. Many members who will have been defeated, others who will be retiring voluntarily, an organization that possibly may have been repudiated at the polls, still will have the power to pass on appropriations for the fiscal year ending nearly two years after the election. It also may pass any other national legislation.

The supply bills, of course, preclude any great attention to general legislation during the short session. But the passage of the supply bills has been simplified by the budget system recently put in operation; also by the good rule, more and more adhered to by the House of Representatives, which precludes general legislation—such as riders—from regular appropriation measures.

Whether the budget system is to operate in reality or perfunctorily will be determined largely at the coming short session. It will be decided by the extent in which Congress accepts the estimates of the Budget Bureau or rather by whether it increases or adds to those estimates. Material increases are unlikely; hence such further economies as the Budget makers can originate no doubt will become effective. These economies. while in the aggregate possibly large, will not be big enough to bring about any material reduction, proportionately, in the expenditures of the Federal Government. There may be additions, such, for example, as were made a year ago in the matter of rivers and harbors appropriations. The large ones that most likely will be insisted upon at the short session will be for public buildings throughout the country. Another possible one may have to do with the St. Lawrence Waterways proposal, which may come up for action by the present Congress. It is a subject of gigantic proportions, involving hundreds of millions of cost, as well as trade and, in several directions, international problems. It provides for certain improvements in the St. Lawrence River in Canada whereby ocean traffic may be extended to all the Great Lake ports.

But it is doubtful if the St. Lawrence Waterways subject is sufficiently crystallized for definite action to be taken on it at the short session.

The ship subsidy bill, however, is likely to be acted upon, unless the Administration, which has backed it. becomes convinced that it has no chance of adoption. It involves the making of large appropriations, as well as many collateral problems, bearing particularly on matters of general commerce. Its fate if determined at the short session is at the present writing at least, very doubtful.

Another measure which is known chiefly by its sentimental aspects but yet may have big future bearing on our

foreign trade will be acted upon almost certainly. It is the Liberian loan, whereby we would advance the Republic of Liberia $5,000,000 and take over the virtual management of its affairs. It has passed the House and has been debated in the Senate. If finally adopted it will give the United States a firm foothold in Africa, where great possibilities for trade expansion lie and are now controlled almost absolutely by European powers.

Congress also must take further action on another subject of commercial as well as of general significance. It is foreign immigration. The quota law, whereby immigrants from European countries are limited severely in number, will soon expire unless again extended or supplanted by permanent legislation with reference to immigration. While the law has accomplished much by way of restricting immigration, it is unsatisfactory even to those most opposed to the open door policy of former years. Most of the immigrants it admits are from the least desirable populations while it tends to restrict most radically the immigration of the more desirable peoples, such as northwestern Europeans. It may be that Congress at the short session will find time to make complete revision of our immigration laws. If it does the result will be severe and probably more intelligent restriction. Public sentiment clearly is for firm barriers against an unlimited inpour of peoples from Europe, especially those of the more or less unassimilable classes. However, a subtle propaganda counter to that view is now at work. Congress probably will continue to avoid final determination of the matter, although the present House Committee has done some excellent work and have all the information for a permanent bill in hand.

It is unlikely that any important tax legislation will be taken up at the short session, despite the prospect of a large deficit in revenues. Some contend that revived business will so refresh the sources of taxation under present laws that there will be no deficit.

The soldiers' bonus proposal for the present is out of the way; but by no means dead. It probably will come up again when the new Congress meets next year; its treatment will depend largely on the results of the November election, not as to parties but as to individual candidates. There may be enough bonus advocates in both Houses of the next Congress to pass the bonus bill. even over another presidential veto. It is a subject which those who disapprove should by no means view as closed by its recent handling unsatisfactorily to its advocates. Those who favor it do not, by any means, take that view.

Two lines of important financial legislation may be fought out at the short session. The "Farm Bloc" is determined to put all its chips on the table in an effort to win further extension of Federal credit to agriculture. What they propose to center on is some form of personal credit machinery, whereby the Government regularly may make loans on farm products. Another and highly important question of general finance revolves around the proposed Constitutional amendment making income from public securities taxable. This would affect every state, city or other governmental unit which sells bonds. If it comes to a vote it has a fair chance for passage.

Thus the work of the short and final session of the Sixty-Seventh Congress may be of big importance. It is well to observe it closely, rather than ignore it in the belief that the November election settles everything; in fact, the election will have little effect on it.

The Responsibility of Leadership.

In a well known university several years ago was a young student specializing in the study of psychology. Being a great personal admirer of his tutor, he was constantly studying the mental characteristics of the man and endeavoring to incorporate into his own processes of thinking and methods of decision those faculties which had been so highly developed by his mentor. In striving to do this, he contrived to be as much as possible in intimate association with the learned professor.

The pedagogue in question was afflicted with a physical infirmity which caused a noticeable limp in his step when walking—and this was a fact which the boys on the campus noticed to the extent of "dubbing" him with the appelation of "Limpy" Stough.

For two years the young student was the boon associate of the professor, all the while absorbing the mental processes of his elder, until eventually the close companionship produced a physical effect upon him, and it became a familiar sight on the university grounds to see the old professor trudging along with his "limp"—and the young pupil by his side, with a "limp" in his step equally as noticeable as that of the older man. The close association between the two had caused the younger man to develop a defect in his step, and as his stature and physique was otherwise that of the normal young man, this defect was attributable only to the psychological action which oftentimes forms some of our more important characteristics, though we may be serenely unconscious of the workings of such influences until their effects have become apparent.

Due to the very close association and connection between the civic and industrial life of the average cotton mill and its community, every mill executive, every mill superintendent, every overseer, is a Professor Stough. The great mass of the workers are represented in the young, aspiring student. Therefore, in every mill the supervisory force have their obligations to society in general which they should always recognize and fulfill to the best of their ability. Whether the mill be located in a city or larger community where the contacts of these men with the employees are necessarily limited and confined within the plant itself, or whether it be situated in a community of its own, surrounded by its village, where the operating executives live within a stone's throw of the workers, and where every deed and action of such men are subject to cognizance and emulation by the people, these obligations should be met.

Especially when a manufacturing enterprise is carried on under conditions where not only the mill, but the homes of the workers are owned, and the civic conditions influenced, by those in authority in the plant, those leaders are placed in a position which makes it necessary for them to accept even greater responsibilities than would otherwise come to them.

Their managerial positions within the mill automatically impose upon them certain supervisory responsibilities in the community, which must be observed and acted upon if their full duty to the company, to the community, and to society

is performed. This condition, however, carries with it a great element of danger which must be recognized and averted by intelligent effort and action.

But with all of its possibilities of dangerous effect through a failure in the fulfillment of the responsibility, the condition also presents a challenge to the superintendent or other official so situated. In his hands he holds the destiny of a great body of people. By reason of his superior position in the community, these people but naturally look to him for advice and counsel, for a pattern, an example by which they may shape their own activities. He is their leader, their guide, often their adviser and arbiter and through that strange psychological process they are affected by his every word and action. Unconsciously, perhaps, both on the part of the leader and on the part of the worker, this same psychological law which gave the young student the "limp" of his mentor holds equally strong in this application.

It is, then, the unquestionable and irrevocable duty and obligation of every man in a supervisory or managerial position to so shape the course of his own actions that he may know, if called to the bar of accounting for his execution of the trust placed in him, that the influence of his life upon his people has been one of uplift, of good works—and one of benefit to society. He has then fulfilled his greater responsibility in a manner worthy of the trust, and his ultimate reward is fully commensurate with the keeping of his faith.

Determining Costs in a Cotton Mill

BY BENN KERSHAW.

(In the first article of this series which appeared in the September number, it was pointed out that in finding costs in a cotton mill it is necessary to divide the various operations in each department into units, each unit to include only the machines which perform similar operations and through which the stock passes in practically the same manner. A cloth mill of 67,000 spindles was selected as an example and a unit table made up showing how this mill was divided. Then, under sub-headings, came the details of the card room. These covered the pickers, cards, combers, drawing frames, and roving frames, thus leading up to the spinning room. The second article, in the October number, continued these details through the spinning room, including spooling, twisting, warping, slashing and drawing-in. Any new subscribers to COTTON who may wish to secure the September and October articles in order to keep the series complete will have their requests granted as long as copies of those numbers are obtainable.—Editor.)

Weave Room.

Under this head will be included both the weave room and the cloth room, taking first the weave room.

As practically all mills pay their weavers on the piece work basis, no very difficult problems are presented in obtaining the cost per pound in this department, the pay being based on so much per cut, this cut being a roll of cloth made up of a certain number of yards, the number varying in different mills and also on the different styles in the various mills.

Having determined upon the cut length, and knowing the price per cut, the yards per pound also being known, it is a very easy matter to obtain the labor cost per pound for weaving. The weavers' cost table gives the weaving price per cut, the yards per cut, weaving cost per yard, yards per pound and the weaving cost per pound. The weaving cost table has been figured out on the basis already explained, the work being arranged in such a fashion as to be easily understood, and in order to simplify matters as much as possible, the yards per cut have been set at 60 in each case.

It is just as easy to figure this table with any cut length, but in case a different length of cut is used, of course the final result would be varied from the results as here shown.

Looking at this table, let us take for instance Style A. The weaving price here given is .555 per cut, this being

TABLE FOR WEAVERS' COST ONLY.

Style	Price Per Cut	Yards Per Cut	Weaving Cost Per Yd.	Yards Per Lb.	Weaving Cost Per Lb.
A	.555	60	.009250	5.00	.046250
B	.543	60	.009005	8.50	.076542
C	.50	60	.008333	11.75	.097912
D	.522	60	.008700	16.46	.143202
E	.492	60	.008200	12.30	.100860
F	.492	60	.008200	14.10	.115620
G	.528	60	.008800	11.00	.096800
H	.536	60	.008933	10.66	.095225
J	.496	60	.008266	15.36	.116965
K	.474	60	.007900	13.06	.103174
L	.496	60	.008266	14.52	.120022
M	.558	60	.009300	10.31	.095883
N	.724	60	.012066	6.75	.081445
P	.683	60	.011383	6.75	.076835
R	.712	60	.011836	14.63	.173160
F.A.	.802	60	.013366	10.96	.146491
F.B.	2.00	60	.033333	10.31	.343663
F.C.	.802	60	.013366	11.82	.157986
F.D.	2.86	60	.047666	9.25	.430910
F.E.	.90	60	.015	8.53	.127950
F.F.	.963	60	.016050	16.59	.266269
F.G.	.965	60	.016083	11.15	.179325
F.H.	1.723	60	.028716	5.16	.148174
F.K.	1.331	60	.022186	10.75	.238499
F.M.	2.192	60	.036533	14.48	.528998

the price paid for a cut 60 yards in length. The weight of the goods is shown to be five yards to the pound. Then $.555 \div 60 = .009250$ which is the cost per yard, and multiplying this figure by 5, which is the yards per pound, we get $.009250 \times 5 = .046250$ as the weaving cost per pound.

Having obtained the cost per pound for weaving alone, it remains now to add to this the general labor cost which represents the cost of loom fixers, changers-over, smash piecers, etc., these costs being shown in the weave room pay roll in the form of wages paid to day labor. There are three divisions made in the pay, the first division being composed of help general to the whole room, the second division being help having to do with the plain looms only, while the third division is composed only of those persons whose work brings them in actual contact with the fancy looms.

The loom method is without question the best for the distribution of these costs, although in some minor instances it may not be strictly accurate. For instance, it may be said that the number of filling carriers is not in proportion to the number of looms, but rather in direct proportion to the pounds of filling being used. To make exceptions in these minor cases, however, would hardly justify the labor expended, as the results would vary so very slightly.

WEAVE ROOM PAY ROLL.

Occupation	Hours Per Week	Rate Per Hour	Total Weekly Wages	General Plain or Fancy	Total
Day Labor.					
1 Overseer	48		40.00	General	
1 Second Hand	48		32.50	General	
1 Clerk	48		12.00	General	
3 Smash Piecers	48		40.00	General	
1 Beam Carrier	48		14.00	General	
3 Filling Carriers	48		45.00	General	
1 Scrubber	48		8.00	General	191.50
8 Plain Loom Fixers	48		208.00	Plain	208.00
10 Fancy Loom Fixers	48		280.00	Fancy	
3 Changers Over	48		78.00	Fancy	
2 Chain Boys	48		21.00	Fancy	
4 Drop Wire Boys	48		40.00	Fancy	419.00
38 Hands			818.50		818.50

Piece Workers.

Occupation	Type of Work	Total Pay
Weavers	Plain	903.65
Weavers	Fancy	1857.31
	(Day Labor)	818.50
Total Weave Room Pay Roll		3579.46

In distributing the costs for general labor it must be kept very clearly in mind that there are certain costs that must be charged against the fancy work only, as they are in no way chargeable to the plain work. Again, there are charges which must go against the plain work only, as they cannot be considered a charge against the fancy work. There are also charges which must be considered chargeable to both.

Taking these things into account it will be seen that it is necessary to split the charges common to both plain and fancy work on the loom basis and after this the separate charges against the plain and fancy work can be handled separately. When figuring this it is very necessary that the number of looms on each style be known, this being shown in the weave room style table, as well as the number of pounds run on each style.

WEAVE ROOM STYLE TABLE.

Plain Styles	Number of Looms	Pounds Run	Fancy Styles	Number of Looms	Pounds Run
A	125	4163	F.A.	75	1309
B	125	2450	F.B	70	823
C	35	522	F.C.	35	567
D	75	759	F.D.	125	1735
E	25	423	F.E.	45	1559
F	35	517	F.F.	50	1017
G	35	530	F.G.	90	2723
H	35	547	F.H.	25	659
J	15	191	F.K.	35	632
K	35	596	F.M.	35	321
L	30	382			
M	70	1131			
N	70	1279			
P	70	1381			
R	35	295			
Total	815	15,166	Total	585	11,345

The total number of looms is 1400. On the plain work there are 815 or 58.21 per cent, while 585 or 41.79 per cent are on fancy. Now 58.21 of 191.50, which is the general room expense, gives 111.47 as the amount to be charged to plain work, which, when added to the direct charge of 208.00 on plain, gives a total amount of 319.47 to be divided among the plain looms. This amount, when divided by 815 plain looms, gives a cost per loom of .391987.

Following this same method, 41.79 per cent of the looms are on fancy and 41.79 per cent of 191.50 general room expense, gives 80.03 to be charged to fancy work, this amount being added to the direct charge of 419.00 on fancies, gives a total of 499.03 to be divided among the fancy looms. Now when this amount is divided by the number of looms on fancy or 585, it gives a cost per loom of .853042 on fancy work.

When obtaining the cost per pound, simply multiply the cost per loom on plain, if it is plain work, or by the cost per loom on fancy if on fancy work, by the number of looms on that style, and divide the result by the pounds run on that style.

For instance, on Style A there are 125 looms, which when multiplied by the cost per loom on plain, or .391987, gives 48.998375 and upon this amount being divided by the pounds run or 4163 it gives .011769 as the cost per pound on this style. Following out this method on each particular style gives the results shown in the accompanying table as the cost per pound on each style.

WEAVE ROOM GENERAL EXPENSE TABLE.

Style	Number of Looms	Cost Per Loom	Total	Pounds Run	Cost Per Pound
A.	125	.391987	48.998375	4163	.011769
B	125	.391987	48.998375	2450	.019998
C	35	.391987	13.719545	522	.026282
D	75	.391987	29.399025	759	.038733
E	25	.391987	9.799675	423	.023167
F	35	.391987	13.719545	517	.026536
G	35	.391987	13.719545	530	.025885
H	35	.391987	13.719545	547	.025081
J	15	.391987	5.879805	191	.030784
K	35	.391987	13.719545	596	.023019
L	30	.391987	11.759610	382	.030784
M	70	.391987	27.439090	1131	.024260
N	70	.391987	27.439090	1279	.021453
P	70	.391987	27.439090	1381	.019869
R	35	.391987	13.719545	295	.046506
F.A.	75	.853042	63.978150	1309	.048875
F.B.	70	.853042	59.712940	823	.072555
F.C.	35	.853042	29.856470	567	.052656
F.D.	125	.853042	106.630250	1735	.061458
F.E.	45	.853042	38.386890	1559	.024622
F.F.	50	.853042	42.652100	1017	.041939
F.G.	90	.853042	76.773780	2723	.028194
F.H.	25	.853042	21.326050	659	.032361
F.K.	35	.853042	29.856470	632	.047241
F.M.	35	.853042	29.856470	321	.093010

Cloth Room.

The method of finding the labor cost per pound in this department is that of dividing the total of the payroll by the total number of yards run. The cost per yard is first found in this manner, after which the cost per pound of the different styles is finally found by multiplying the cost per yard by the yards per pound.

When finding the cost per pound from the average cost per yard, as shown in the manner just described, the minor variations which may cause one style to cost a very small fraction more or less than some other style are not taken into account, as the cost in this department is so small in the case of mills, such as the one under consideration, whose finishing is not done in the mill, the average cost being near enough for any practical purpose.

The table headed "Cost Per Pound in Cloth Room" should be self-explanatory, but in case it is not a few words of explanation will be here given. The items in the second column are the yards run on each style, while the figure in the third column is the cost per yard, found by dividing the total amount of pay roll, which is 298.76 as will be shown later, by the total amount of yards woven,

COST PER POUND IN CLOTH ROOM.

Style	Yards Run	Cost Per Yard	Yards Per Lb.	Cost Per Lb.
A	20,815	.000718	5.00	.003590
B	208,250	.000718	8.50	.006103
C	6,133	.000718	11.76	.008436
D	12,494	.000718	16.46	.011818
E	5,203	.000718	12.30	.008831
F	7,290	.000718	14.10	.010123
G	5,830	.000718	11.00	.007898
H	5,831	.000718	10.66	.007653
J	2,934	.000718	15.36	.011028
K	7,784	.000718	13.06	.009377
L	5,547	.000718	14.52	.010425
M	11,660	.000718	10.31	.007402
N	8,633	.000718	6.75	.004846
P	9,322	.000718	6.75	.004846
R	4,316	.000718	14.63	.010504
F.A.	14,346	.000718	10.96	.007869
F.B.	8,485	.000718	10.31	.007402
F.C.	6,702	.000718	11.82	.008486
F.D.	16,049	.000718	9.25	.006641
F.E.	13,298	.000718	8.53	.006124
F.F.	16,872	.000718	16.59	.011911
F.G.	3,131	.000718	11.15	.008005
F.H.	3,400	.000718	5.16	.003704
F.K.	6,794	.000718	10.75	.007718
F.M.	4,648	.000718	14.48	.010396

Total Yds. 415,767

which will be found at the foot of the second column. The figures in the fifth column are the cost per pound of each respective style and are found by multiplying the cost per yard, as shown in the third column, by the yards per pound as shown in the fourth column.

In case the mill should finish their own goods, then the cost per yard for finishing would of course be figured and added to the cost per pound in order to place the correct cost on each style.

The pay roll of the cloth room is given in the accompanying table, and as this is all day labor, no further explanation is needed than the one already given in figuring the cost per pound.

CLOTH ROOM PAY ROLL.

Occupation	Hours Per Week	Rate Per Hr.	Total Weekly Amount
1 Overseer	48	.625	30.00
1 Clerk	48	.2041	10.00
20 Inspectors	48	.2095	201.20
3 Folders	48	.2083	30.00
1 Pressman	48	.345	16.56
1 Helper	48	.2291	11.00
Total			298.76

Summary of Labor Costs.

It is now possible, at this stage, to obtain the total labor costs per pound on the different styles being run, as well as being advisable at this point to do so. There is one point that now presents itself in this connection and one that is very important to a correct understanding of the method adopted when assembling the labor cost in the various departments, in order to obtain the total labor costs on any particular style, that is, that a pound of cloth, which is the amount used when denoting the cost, is made up of a fractional part of a pound of warp yarn and a fractional part of a pound of filling yarn.

Consequently it is not possible to attach directly to a pound of cloth the labor cost of spinning for instance. The labor costs on the different yarns must first be assembled and brought down to that point where the yarns for the first time are considered as a part of a certain style, which in this case is at the warpers.

After having found the labor cost per pound of the warp yarn up to this point, it is not the labor costs of one pound of a certain yarn that is used, but the labor cost per pound of that style into which the yarn may pass. To the labor cost per pound of the warp yarn there is added the labor cost per pound of warping, slashing and drawing-in for the style using this yarn.

This brings the calculation up to weaving, at which point the percentage of warp and filling in a pound of cloth must be used, to determine how much of the yarn cost is warp and how much is filling. Take, for instance, Style A, this cloth is made from 35s warp and 50s filling. The labor cost per pound on these two counts, up to warping, is as follows, these figures being taken from tables previously given:

	35s Warp	50s Filling
Labor cost per pound in card room	.028171	.035154
Labor cost per pound in spinning room	.018689	.032874
Labor cost per pound in spooling room	.008762	
Total labor cost to this point	.055622	.068028

From this point up to weaving, the warp yarn alone is considered and the figures are as follows:

Labor cost per pound up to and including spooling on 35s warp yarn	.055622
Labor cost per pound on warping Style A	.003745
Labor cost per pound on slashing Style A	.004078
Labor cost per pound on drawing-in Style A	.038330
Total	.101775

This shows the total labor cost per pound for warp yarn on Style A up to weaving to be .101775. Since 59 per cent of the weight of the cloth is warp yarn, then 59 per cent of .101775 or .060047 represents the labor cost on the warp yarn in one pound of cloth. And as 41 per cent of the weight of the cloth is filling yarn, then 41 per cent of .068028 or .027891 is the labor cost on the filling yarn in one pound of cloth. Combining these two and adding to them the labor cost per pound in the weave room and cloth room gives the total labor cost per pound:

Labor cost per pound on warp	.060047
Labor cost per pound on filling	.027891
Weaving cost per pound	.046250
Cost per pound general expense weaving room	.011769
Labor cost per pound in cloth room	.003590
Total labor cost per pound Style A	.149547

If the warp yarns in any style contain different counts of yarn, carry each separate count through up to weaving, exactly as though it were the only count in the cloth, then split the total costs of each, up to this point, by the percentage that each bears to a pound of cloth. The accompanying tables show the labor cost per pound on filling and

LABOR COST PER POUND OF WARP YARNS IN PLAIN STYLES—UP TO WEAVING.

Styles	A	B	C	D	E	F	G	H	J	K	L		M	N	P	R
Counts	35	55	60	90	50	60	60	60	80	60	100	50	55	70	70	60
Yarn Costs	.055622	.100008	.100759	.163506	.087120	.100759	.100759	100759	.143042	.100759	.196592	.087120	.100008	.120976	.120976	.100759
Warping	.003745	.007226	.007603	.018612	.006999	.007859	.008203	.008029	.012586	.007959	.011827	.011827	.007410	.011472	.011614	.008187
Slashing	.004078	.006276	.009323	.015901	.008418	.009637	.009000	.008369	.017888	.006918	.013399	.013399	.006436	.009643	.009757	.009847
Drawing and Twistin-In	.038330	.030878	.028016	.029529	.023690	.023518	.031034	.032359	.029977	.029913	.033156	.033156	.030850	.028225	.030128	.030742
Totals	.101775	.144388	.145701	.227548	.126227	.141773	.148996	.149516	.203493	.145544	.254974	.145502	.144704	.170316	.172475	.149535

LABOR COST PER POUND OF WARP YARNS IN FANCY STYLES—UP TO WEAVING.

Style	F. A.	F. B.		F. C.	F. D.			F. E.		F. F.		F. G.			F. H.	F. K.	F. M.
Counts	45	80	40/2 Mer	60	40/2	50	90	65/2 H. T.	45H.T.	65/2	120/2	80/2	40/2	50	50	60	60
Yarn Costs	.071248	.143042	.078635	.100759	.078635	.087120	.163506	.196202	097210	.171779	.328464	.183656	.078635	.087120	.087120	.100759	.100759
Warping	.005313	.010580	.010580	.007894	.012819	.012819	.012819	.004940	.004940	.007665	.007665	.005191	.005191	.005191	.006556	.007771	.008061
Slashing	.007146	.019370	.010370	.008595	.005741	.005741	.005741	.017102	.017102	.011749	.011749	.006392	.006392	.006392	.006029	.006750	.007863
Drawing and Twisting-In	.024826	.040085	.040085	.029731	.061940	.061940	.061940	.015054	.015054	.029758	.029758	.040864	.040864	.040864	.047313	.047541	.033004
Totals	.108533	.204077	.139670	.146979	.159135	.167620	.244006	.233308	.134306	.220951	.377636	.236103	.131082	.139567	.147018	.162821	.148887

TOTAL LABOR COST PER POUND ON PLAIN STYLES.

Styles	A	B	C	D	E	F	G	H	J	K	L		M	N	P	R
Warp Counts	35	55	60	90	50	60	60	60	80	60	100	50	55	70	70	60
Filling Counts	50	60	85	130	75	75	85	90	120	90		120	75	45	45	22/26D.
Per cent. Warp	59	51	59	59	60.2	57.2	60	62.5	63	69.5	25.3	44.6	59	29	32	74
Per cent. Filling	41	49	41	41	39.8	42.8	40	37.5	37	30.5		30.1	41	71	68	26
Warp Cost	.060047	.073637	.069434	.135367	.076741	.081094	.089397	.080733	.128200	.101153	.064508	.065451	.085375	.049391	.055133	.110657
Filling Cost	.027891	.045292	.059296	.100912	.050284	.054075	.057850	.054271	.097134	.045767		.067442	.051801	.052314	.050103	
Weaving	.046250	.076542	.097912	.143202	.100860	.115620	.096800	.095235	.116965	.103174		.120022	.095883	.081445	.076835	.173160
Gen. Weaving Expense	.011769	.019998	.026282	.038733	.023167	.026536	.025885	.025081	.030784	.023019		.030784	.024260	.021453	.019868	.046506
Cloth Room	.003590	.006103	.008436	.011818	.008831	.010123	.007898	.007653	.011028	.009377		.010425	.007402	.004846	.004846	.010594
Total	.149547	.225652	.261369	.430033	.259883	.287448	.276830	.262963	.284111	.282490	.064508 .358632	.294124	.264721	.209449	.206786	.340825

TOTAL LABOR COST PER POUND ON FANCY STYLES.

Style	F. A.	F. B.		F. C.	F. D.			F. E.		F. F.		F. G.			F. H.	F. K.	F. M.
Warp Counts	45	80	40/2 Mer	60	40/2	50	90	65/2H.T.	45H.T.	65/2	120/2	80/2	40/2	50	50	60	60
Filling Counts	70	100	40/2 Mer	75		130			120/4		50		50		50	90	14/16D.
Per Cent. Warp	61	43	15.8	59	5	32	42	13.5	38.25	3.5	56.4	43.6	7.2	23.2	54	67	85
Per Ct. Filling	39	27.3	13.9	41		21			48.25		40.1		28		46	33	15
Warp Cost	.066205	.087753*	.022067	.104025	.007956	.053030	.097268	.031495	.051372	.008591	.217248	.102940	.009440	.031938	.078364	.109090	.135723
Filling Cost	.043069	.047090*	.023285	.051801		.051686			.152164		.027279		.020440		.036164	.050142	
Weaving	.146491		.343663	.157986		.430910			127950		.266269		.179325		.148174	.238499	.528998
Gen. Weaving Expense	.048875		.072555	.052656		.061458			.024622		.041939		.028194		.032361	.047241	.093010
Cloth Room	.007869		.007402	.008486		.006641			.006124		.011911		.008005		.003704	.007718	.010396
Total	.312509	.134843 .603815	.468972	.374954	.007956	.603725 .708949	.097268	.031495 .393727	.362232	.008591	.564646 .573237	.102940	.245404 .380282	.031938	.298767	.452690	.668127

LABOR COST PER POUND OF WARP YARNS—UP TO WARPING.

Stock	1⅛	1⅛	1⅛	1¼	1¼ E	1¼	1¼	1¼	1¼E	1¼E	1¼E	1⅜	1⅜	1⅜	1⅜	1½S.I.	1½S.I.
Hank Roving	8	8	8	10	10	10	12	12	14	14	14	14	16	16	18	20	25
Counts	35	40	40/2	45	45H.T.	50	55	60	65H.T.	65/2	65/2H.T.	70	80	80/2	90	100	120/2
Card Room	.028171	.028171	.028171	.035154	.045685	.045744	.049633	.049633	.055370	.055570	.055570	.056417	.065749	.065749	.071826	.084659	.105337
Spinning	.018689	.022447	.022447	.026080	.041511	.030611	.039110	.039110	.070400	.070400	.070400	.050289	.060395	.060395	.070400	.084395	.111166
Twisting			.019151							.032791	.057214			.040614			.074909
Spooling	.008762	.008866	.008866	.010014	.010014	.010765	.011265	.012016	.013018	.013018	.013018	.014270	.016898	.016898	.021280	.027538	.037052
Total	.055622	.059484	.078635	.071248	.097210	.087120	.100008	.100759	.138988	.171779	.196202	.120976	.143042	.183656	.163506	.196592	.328464

LABOR COST PER POUND OF FILLING YARNS—UP TO WEAVING.

Stock	1⅛	1⅛	1¼	1¼ E	1¼	1⅜	1⅜	1⅜S.I.	1⅜S.I.	1⅜	1½S.I.	1⅞E	1⅞S.I.
Hank Roving	8	8	10	10	12	14	16	18	18	20	25	25	25
Counts	40	40/2	50	45	60	70	75	85	90	100	120	120/4HT.	130
Card Room	.028171	.028171	.035154	.045685	.049633	.056417	.065749	.073715	.073715	.081783	.105337	.100512	.105337
Spinning	.022680	.022680	.032874	.027997	.042800	.054018	.060595	.070911	.078231	.090709	.118723	.162013	.140791
Twisting		.016217										.048017	
Totals	.050851	.067068	.068028	.073682	.092433	.110435	.126344	.144626	.151946	.172492	.224060	.310542	.246128

*6 cents per pound added to labor cost for mercerizing.

warp yarns up to warping on each style, worked out as just stated. All figures being used here having been taken from tables previously given.

(This is the third of a series of articles on mill cost keeping by Mr. Kershaw. Others will follow in early issues.)

The new edition of Davison's Textile Blue Book has been completed, according to an announcement by the publishers, and is now ready for distribution. This year's edition, the 35th, contains the usual extensive information with every mill report revised up-to-date, and 840 new manufacturers have been added, while the necessary deletions for those out of business and the changes in names, etc., have been made. A useful list of the new mills not previously reported is shown separately, as is a list of mills with dye houses, and a classified directory of dyers and finishers has been added. A new section reports over 2,000 foreign cotton firms. The directory is issued in the customary sizes and copies can be obtained from the publishers, Davison Publishing Co., 50 Union Square, New York.

A revised edition of "Textiles" by A. F. Barker, M. Sc., has been published by D. Van Nostrand Company. The first edition was produced in 1910, and in the present edition certain additions and revisions have been incorporated to bring the work up to date. In this volume, Dr. Barker, a well known writer on textile subjects, has attempted to cover in a general way the practical technic of the whole of textiles, including wool, cotton, silk, linen, etc. A chapter is devoted to each manufacturing process, and other sections of the book treat the history and resources of the industry in general. While the task attempted is a rather difficult one to accomplish, the author, who has many year's of intimate association with the different branches of the industry, has covered the subject with comparative completeness, although it is but natural that detail cannot be considered in covering such a wide and diversified field in one volume. Special recognition is made of a number of contributed chapters from men prominent in the English textile industry. The price of the book is $4.50 per copy net, and the copies may be secured from D. Van Nostrand Company, 8 Warren St., New York City.

Southern Textile Association

Before we start in on the details of the Greenville meeting of the Southern Textile Association last month, let's go back over a bit of some of the organization's recent history. This may give somewhat of a mental preparation for the digestion of what transpired at this good meeting. For it was a good meeting, if we may repeat, and the developments were evidence of a previously prepared and cultivated background which has been in preparation in the Association's activities in recent months.

Beginning in December, 1920, the Association started a plan of departmental discussion meetings, at which practical problems of the various mill departments are taken up and thrashed out from all angles by the mill men themselves in a round-table discussion. Perhaps to the doubting Thomas the initiatory efforts were not overwhelmingly successful in themselves as to the actual information brought out at the meeting. Granted, perhaps. But during these last two years the Association has held eight of these meetings besides its regular meetings, and in each succeeding discussion, with the experience gained in former meetings as a guide, success has been greater and greater, and now the Association looks forward to still greater accomplishments in this direction.

Perhaps, as has been mentioned, in the outward appearance of things the first carders' meeting in Charlotte didn't stir all textiledom with interest and wonder. But it put the men to thinking! Naturally, being practical cotton mill men and neither Congressmen nor orators, the fellows were a bit reticent at first blush, because the idea was new to them; it came rather as a surprise to most of them—to get together with their fellow operating executives, in an open, informal meeting, and discuss things that formerly, and not long ago at that, were kept within the mill.

But the merit of the idea unmistakably manifested itself, and the men went home and began to think things over. They came to the spinners' meeting in Spartanburg and the value of the idea become more apparent; to the meeting of weavers at Greenville, where greater success came. And so on through the other departmental meetings, and the regular meetings, each time one could see more interest, more thought, more enthusiasm, in what was said, and when they found out how easy it was to get up and take part in the discussion, as they began to catch the potential possibilities in this idea-exchanging and constructive discussion, the greatness of the accomplishments which could be achieved became more and more obvious.

To one who has watched the growth of these discussions, and the recent developments in the southern textile industry, it is not exaggeration to say that the effects and the results of these meetings have been a great determining factor in a series of influences which have carried, and are carrying, the industry in the southern section on to greater prominence, to more recognition, to greater accomplishments, and to the realization of the bigness of the possibilities that lie ahead to be developed with this constructive work if it continues to be carried on along these lines. It is to quote the industry's leaders to declare that wonderful opportunities are awaiting discovery and use in the cotton mills—and it is from no less farsighted and deep-thinking opinion that the belief is found that such co operative work as this will be one of the greatest and most effective methods of achieving these results.

With this background before us let us go into a report of the Greenville meeting, for what was done there is but a result of this preparation, and in the seriatim report of the proceedings which follows, the influence of these factors will be seen.

The First Session.

President John W. Clark called the first session to order at 2:30 o'clock on Friday afternoon, October 20, in Cleveland Hall. The mayor of Greenville, who was scheduled for an address of welcome, was detained elsewhere, and the chairman entered at once into the program of the meeting. He opened the session with a few brief remarks, declaring that the Association "is always glad to come to Greenville; it is a wide-awake, progressive city, typical of the new South. Several years ago there originated in the mind of the general chairman the idea of dividing the work of the Southern Textile Association into groups, and having each meeting conducted on round-table discussion methods. These group meetings developed into our sectional meetings, and those of you who have attended these sectional meetings know the great good that has come out of them. It is where a complete and intensive study is made and each individual man concentrates his attention upon one department and the problems connected with it.

JOHN W. CLARK, PRESIDENT.

"At Anderson on July 21, we had a meeting of weavers, which was presided over by W. H. Gibson, Jr., of Union. For an entire day the attention of those present was concentrated upon the weave room and its problems, and as it is very important that we should follow up the work done at these meetings, we have asked Mr. Gibson to make a report at this convention of the work done by the weavers' section."

Chairman Gibson was presented to the meeting, and in beginning his report of the Anderson meeting, he pointed out the necessity for "follow-up" efforts on the work done in the discussions. He declared that sometimes there is considerable discussion on a point and yet nothing definite is brought out as a result, and stated it as the desire of the Association to be able to arrive at some definite conclusions in this work. He also emphasized the value and importance of general participation in the discussions. "Over at Anderson we had something more than 200 weavers and superintendents, and you can imagine the difference in the opinions of 200 men, compared with one or two mens' ideas. You certainly get a good deal more information than would be the case if one man said it all." He then proceeded with his prepared report, which summed up the consensus of opinion on the numerous subjects relating to slashing and weaving that were discussed at the Anderson meeting.

This report consisted of the set questions which were submitted at the Anderson meeting, together with the consensus of the expert opinion as expressed on the subject in each instance. This discussion was reported fully in the September number of COTTON, and Mr. Gibson's report, summing up the ideas and discussion there expressed, follows:

"What temperature is the best for boiling size and how long should it be boiled? Opinions on this question were considerably divided. However, it seemed to be the consensus of opinion that the heat in the size kettle should be kept at around 220 to 225 degrees, and cooked for one hour, or more, as starch in the sizing kettle will remain at a very high degree of temperature for a number of hours after the steam has been cut off; due to the fact that the starch in the size helps to hold the heat.

"At what temperature should size be kept in the size vat at the slashers? We believed for a long time that a great many people were at a loss as to just what degree of heat was really obtained in the size vat and many were surprised when the temperature was taken in these size vats and found to be considerably below the boiling point of 212 degrees. The pressure of the steam from the steam jets in many instances caused the size to 'bubble' up when it really was not boiling. In fact, in an open vat it is almost impossible to get more than 200 degrees.

"How many pounds of steam pressure is best for good running work on the cylinders? This is a question that deserves a great deal of consideration. It depends upon the speed of the slasher, the number of the yarn, the number of ends in the warp, the condition of the steam—whether dry or wet, how far the slasher is located from the boiler, and the condition of the steam lines to the slasher. If the lines are not well covered a considerable amount of condensation will result and the same heat will not be secured as if the pipes were well covered. However, it seemed to be a very practical situation, and those present generally agreed, that with 30s yarn, a warp having from 2,000 to 3,000 ends can easily be dried with from three to ten pounds of steam.

"What is the difference in 20 fluidity and 30 fluidity starch? No satisfactory explanation was offered to this question." (Readers will find two clear and complete explanations of this question on page 977 of the October number of COTTON, prepared by two of the country's leading starch experts.—Editor.)

"What is the proper weight of the squeeze rolls? It was found from the discussion that only a few men really know the weight of the squeeze rolls they use and there were various opinions as to the proper weight of the squeeze roll, depending, of course, upon the class of goods and the number of ends being used at the time. After considerable discussion it was generally agreed that the average weight of the rolls on ordinary work should be around 500 pounds. However, this would not be the case on very fine work or on very coarse work.

"Is it practical to make all even running cuts, that is to measure any given number of yards per cut? The average mill seemed to have been making from 60 to 65 yards per cut. The question in mind was if it was practical to make all cuts run the same number of yards, say 62 yards per cut, without any variation. The meeting went on record as stating that this was not only an impractical proposition, but a physically impossible one, as cuts will vary from one loom to another. Even though it were practical to make each cut the same length at the slasher, it would not weave out the same length per cut from cut mark to cut mark, this variation being due to humidity, change of weather, etc.

"There were quite a few questions before the meeting; particularly in the afternoon, that brought forth some very heated discussions, and more interest was displayed here than at any other stage of the meeting.

"Questions were asked concerning the variation in the width of cloth, the count in the warp, the picks per inch, and the standard method of figuring to determine the number of ends that would constitute any given piece of cloth.

"The most varied opinions probably were on the question of selvage ends being added to the piece of cloth. Several suggestions were offered but none seemed to prove satisfactory. Finally, a committee was appointed by the chairman to try to determine the proper method of figuring, and to make a report at the October meeting of the Southern Textile Association at Greenville.

"It was expressed by some at least who had made tests that cloth would vary on the loom even though no adjustments or changes had been made, this variation being brought about by atmospheric conditions or by the turning on or off of humidifiers.

"There were none who seemed to think that it was practical to make an even running piece of goods in width or count without any variation.

"If yarn or cloth is affected to such a great extent by the weather and atmospheric conditions, then it is beyond the ability of the average man to control these variations, and, of course, the same situation applies to the weight of the goods as well as to the width.

"The average mill might be running along with their weights running within five points of standard, and, in less than one-half of a day, with a sudden change in the weather, weights have been known to change as much as ten points and in some instances even more.

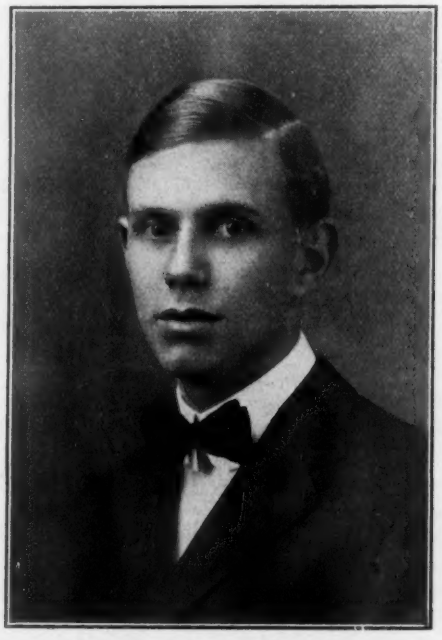
"Under the same conditions of weather changes it has been learned that the width of goods has changed more than one-half inch in less than one hour's time without any adjustment to the loom whatsoever.

"It is understood at the same time when the width and weight varies to the extent indicated, that this is bound to change the picks per inch in proportion to the variation in width.

"The chairman of the weavers' section met with the committee which had been appointed to investigate the matter of selvage ends, and, as that committee will report at this meeting, I will not go into details concerning this report. However, we sincerely trust that the recommendations of this committee will be considered seriously.

"From the best information that we have been able to obtain, we find that at least half of the mills, especially on print cloth numbers, do not add anything for extra selvage ends and they are making just this much extra advantage over the mills who are adding extra selvage ends. This is due to the fact that nowhere does anyone have the authority to set, nor feels right to take the responsibility of setting, a standard, and it is a matter of 'free for all and get what you can.'

"We feel that if these standards were passed on by the



JAMES A. CHAPMAN, JR., VICE PRESIDENT.

Association that we would at least have the backing or the recommendation of the Southern Textile Association, which is considered a good authority. The chairman sincerely regrets that no action was taken at the Anderson meeting, as he understands that many of the sales agents in the North were anxiously watching the weavers' meeting in order that they might pass on some standards and have a guide by which to go."

In his concluding remarks, Chairman Gibson again stressed the desirability of arriving at some definite decisions following the discussions. "The inspiration we get is wonderful to take back home with us," he said, "but in the past we have discussed matters but have come to no definite decisions, and we should do this in order to get the greatest results."

Report of Standards Committee.

In connection with Mr. Gibson's statements with reference to the method of figuring the number of ends in a piece of cloth, President Clark at this point put this question before the Association. In explanation, he said, "Well, suppose you are making a print cloth, 80 x 80, 40 inches wide, would you put in 3,200 ends plus 24 ends for the selvage, or would you figure 3,200 as the total number of ends for the piece of cloth?" He expressed it as his understanding that the New England mills do not figure the selvage extra. He pointed out a possible advantage in this method in that a little coarser reed would be used, together with a somewhat coarser warp yarn, which would give more pounds per spindle, and also cause better weaving. The committee which was appointed at Anderson to offer suggestions in this connection, and of which H. W. Moseley, of Greenville, was the chairman, was asked to present its report at this time.

Mr. Moseley, in making the report of the committee, stated that it had met in Greenville, with Chairman Gibson, on September 16, and offered the following recommendation to the Association in this connection:

"That the number of ends per inch times the width in inches of a piece of cloth of a given construction be a legal piece of cloth.

"That the president appoint a committee to recommend a standard as to variation in width.

"That the Association elect a recording secretary for the purpose of collecting and preserving the records of the Association."

The report was signed by H. W. Moseley, chairman; H. H. Boyd and J. N. Alexander.

Discussion on this report was requested, and Mr. Gibson asked to offer an explanation with regard to the report. "It seems that some thought the question of honesty entered into this suggestion," he explained, "but I want to say that it does not." If a man wanted to be dishonest about it, he pointed out, he could go ahead and take the selvage threads out of the specified count and say nothing about it. But on the other hand, Mr. Gibson explained, the Association found that there was a lack of an understanding or standard for this, that there are hardly two mills running the same number of ends in the same kind of cloth, and the desire was to get together and establish a standard one way or another. He brought out the fact again that some mills are put to a disadvantage under the present method.

MARSHALL DILLING, CHAIRMAN OF THE BOARD OF GOVERNORS.

F. Gordon Cobb, general chairman of the sectional committee work, at this point made a suggestion with reference to the recommendation just read. "I do believe that in establishing a standard on the number of ends in a piece of cloth," he said, "we ought to add the word 'practical.' " In other words, his idea was not to limit the mill to a certain hard and fast standard, but to allow a variation within practicable limits. He pointed out that a variation of four to ten ends should not be barred under the standard, as goods being made in this manner are acceptable and satisfactory, and that, anyway, the difference is equalized when the cloth goes to the bleacher when the variation is slight. "If we got right down to a certain standard, say 3,200 ends for a certain construction, we would establish something that would cause more or less trouble," he continued. The looms would practically all have to be changed, he said, which would put the reed and harness manufacturers to work over time.

On motion by Mr. Cobb, duly seconded and approved by the body, the report of this committee was held over for further discussion at a subsequent meeting.

Descriptions of Inventions.

At this point in the proceedings came a feature to which reference was made in the beginning of this story, and which is another evidence of the forward spirit of the mill men in this section. In line with the spirit of new enterprise and development which has marked all progress since the beginning of time, President Clark declared that "in the Southern Textile Association we believe in progress, and today we have set aside a certain amount of time for the men with creative powers. We appreciate the men who, through the power of creative thought, have brought about new ways, quicker ways, more efficient ways, of performing any task. For this reason we have set aside an hour to discuss new inventions and improvements in our industry."

The meeting was then thrown open to those present who desired to describe any new invention which had been devised by a southern man, and J. S. Strowd, superintendent of the Erwin Cotton Mills, at Cooleemee, N. C., was the first to respond to this invitation.

Mr. Strowd described an invention of a section man in his spinning room. "This," he said, "is a pull down motion for the spinning frame rails. It has an adjustment so that you can put it on the spinning frame and set it so that when the rail gets to a certain height, this works automatically, and shifts the belt and pulls the rail down ready for doffing." He said he had installed it on a number of frames and that it was working very satisfactorily. He emphasized the amount of time to be saved, and also the fact that all the frames using this attachment will be run full and a nice, full quill every time will be the result. In reply to a question from Mr. Hightower, he added that it would save more on coarse yarns than on finer counts, and that it will work equally well on warp and filling, and can be fitted to any make of frame.

W. W. McAbee, of the American Spinning Company, Greenville, was the next man to speak. "The time has come when we have to learn to save," he said. "We have a young man with us who has found a way to take care of crank shafts and pulleys on a loom." Mr. MacAbee then described an improved split hub for worn loom pulleys and crankshafts, which was invented by Archie Greer, the young man referred to. When the tight pulley on the loom become loose on the shaft, it is a well known fact that wear takes place, making it difficult to hold the pulley firmly on the shaft. This is quite an item in the repair bill of practically every weaving mill. To salvage and reuse part of the worn tight pulley and crankshaft rather than to replace these parts with new ones, Mr. Greer has invented a split hub to be inserted in the web of the pulley after the old hub is cut away. This split hub is bolted to the webs of the pulley and extends through to receive the top headgear. The split hub is both keyed and clamped on the crank shaft. The key is held in place by a set screw and the hub is clamped tightly on the shaft with a cap screw and locknut. After the split hub is in use the tight pulley and top headgear can be removed without taking the crank shaft out of the loom. A period of about 30 minutes is required to cut the hub from the tight pulley and fasten in the split hub, it was stated. "I think it is a most wonderful improvement," declared Mr. McAbee when he had finished the description.

Responding to calls from the audience, T. A. Sizemore, superintendent of the American Spinning Company, Greenville, and treasurer of the Southern Textile Association, came to the speaker's table and spoke briefly. "I feel that we should all encourage things like this," said Mr. Sizemore. He emphasized the importance of the superintendents and overseers lending assistance to their workers in the development of any new ideas and improvements. "I have a bunch of inventors out at our place," he continued. "Mr. Williams (overseer of weaving) invented a block to go on his whip roll, whip roll bearings, etc., to take care of the wear on the whip roll. When I saw that I saw it was a good thing and I had it patented for him and bought the rights from him for the American Spinning Company. That not only gave me an advantage, but it encouraged him, and I would not take ten times what that cost the American Spinning Company for it.

"Next came Mr. Leonard (the master mechanic), with a loom drive, and that loom drive is in the exposition building for anyone who wants to see it." (This drive was fully described and illustrated on page 939 of the October number of COTTON.—Editor.) "I encouraged him and helped him in that," continued Mr. Sizemore.

Then a second hand came along, he said, with a wooden block for replacing worn parts, and he paid the inventor for this and has it operating in the plant.

"Next comes Mr. Greer with his split hub," continued Mr. Sizemore, "and I saw what it would do and what it would save the American Spinning Company, and I made a trade for it. Just to show you what extent we take an interest in our people—Mr. Greer did not have very much money, and he wanted to go to Washington to have this thing patented. He went down to our president, Mr. Morgan, and told him what he wanted, and Mr. Morgan said he would be glad to lend him the money to do it with, and let him pay him back as he could. That should be the spirit we should all have in those who are working for us. As I say, I bought the rights from Mr. Greer for the American Spinning Company looms, and we have a number of these running, and so far as I know, there has not been a one that has become loose." This was corroborated by Mr. Williams, the weaving overseer, who said he didn't know of a one that had become loose.

Upon suggestion from J. A. Chapman, Jr., the men were

next invited to explain any new invention which they were operating, whether or not it was of their own design. W. C. Cobb, Cateechee, S. C., described an automatic feed for openers which he declared was one of the best things he had seen.

T. A. Hightower, Edgefield, S. C., was the next speaker, He said he was making surgical gauze—20 x 12, 30s and 40s yarn, with 736 ends to the warp—and was having trouble with the yarn sticking together and clinging together on the lease rods of the slasher. There was not enough yarn going over the cylinders to make a sheet, he said, and in going through the size box it had a tendency to twist and cling together, and his biggest trouble was in splitting the yarn on the lease rods. He said he worked with it and worked with it without any success, and finally put in double headers, which gave him "double trouble." After about three months, he continued, they put in a wooden roll, "where you ordinarily have your metallic roll," where the yarn first comes from the warper. They corrugated this and ran the yarn through in ribbons. That was on the lower head next to the floor. The top head had to put up in the same way, so another roll was put in. The yarn from the bottom beams went over the bottom roll, and the yarn from the top beams went over to the top roll, and this delivered the yarn in tapes that split nicely.

A tire cord splicer was next presented and described by C. L. Upchurch, of Athens, Ga. He reported some excellent results through the use of this device, stating that at one mill formerly a girl did 300 spools a day without rewinding, and after the use of this equipment, the girl does 610 spools and rewinds.

An invention resulting from a difficult war-time order was mentioned by F. Gordon Cobb, general superintendent, Lancaster Cotton Mills, Lancaster, S. C., and general chairman of the departmental committee work of the Association. This, Mr. Cobb said, was devised at the F. W. Poe Manufacturing Company when he was there as superintendent, and it is called a multiplier for dobby looms. Full information, he said, can be secured from the F. W. Poe Manufacturing Co., Greenville, S. C., He explained that the order referred to was for fancy goods made in the manner of the material used in the Indian turban, and requiring a filling pattern about every five yards. He said he could not find a suitable multiplier, and wrote to the builders of fancy looms, who stated nothing like that had ever been devised, but Mr. Cobb pointed out that finally he, with the master mechanic and boss weaver, developed the device mentioned, which he said will do the work satisfactorily.

"I have an invention that is not patented," said D. W. League, overseer weaving, F. W. Poe Mfg. Co., Greenville, "but it is a thing that will help a fellow out when he gets in trouble. We had some orders for surgical gauze some years ago with the construction just spoken of (referring to Mr. Hightower's remarks). We had the E model and K model Draper loom, and were at a loss to find a way to let that warp off fast enough to make the proper construction. At first we tried a large pinion gear on the let off—this was the Roper let-off—but we found that while that let-off was very satisfactory for 32 x 28, 29 x 24, when it came down to 16, 14 and 12 picks to the inch it did not do so well.

"I merely offer this device as a suggestion in case some fellow gets up against it as we did. We wanted to devise some means of accomplishing the result desired without the expense of getting new equipment, and we were working to find a way to make the goods without making the expense too great.

"At the back of the loom we used a lever made from a piece of strap iron, ¼ inch in diameter and about 24 inches long, and we made a stud of cold rolled steel 5 inches in length and ¾ inch in diameter. We turned this down to make a stud for the lever, and to act as a lever support on one end and bolted it to the loom on the other end. We used a piece of cotton tie long enough to reach from let-off pinion shaft around the beam head gear to this lever. This lever is fastened on the back girt where the let-off is fastened to the girt.

"We dropped our let-off down to make room for this stud, and tied the let-off together with pieces of wire so that it would stay in good shape when we wanted to put it back into service. We found that when we got the kinks out of the band, the thing worked very satisfactorily." It was further explained that with a narrow gear on the beam head, a flange can be made to hold this gear in place.

A. B. CARTER, SECRETARY.

Association Dinner.

Nearly two hundred men were present at the Association dinner which was held in the Parish house of the Christ Episcopal church on Friday evening at 6:30. A splendid meal was served by the ladies of the church, and "Pete" Hollis and the Greenville Chamber of Commerce quartet led the singing, and everybody had a big time. Following the dinner, David Clark, who acted as toastmaster, presented the past-presidents of the Association who were present, who made brief talks on the Association work, as well as the incumbent officers. Among these were F. Gordon Cobb and H. H. Boyd, past-presidents; John W. Clark, president; J. A. Chapman, Jr., vice-president; A. B. Carter, secretary, and T. A. Sizemore, treasurer.

The treat of the evening was a talk by Dr. D. W. Daniel, of Clemson College, who gave his famous lecture on "The Measure of a Man."

The Second Session.

On Saturday morning, October 21, at 10 o'clock, the Association assembled at the Grand Opera house for the second and final session of the convention. William S. Charles, assistant employment representative, U. S. Veterans' Bureau, made a brief talk at the beginning of the meeting, appealing to the men present for the cooperation of their mills in the placing of rehabilitated soldiers in suitable vocations.

Following Mr. Charles' talk, President Clark announced that this meeting would be a "Better Goods Session." "It is a splendid thing," he said, "for a man to go through life with the idea of trying to better his best. Last night Dr. Daniels had some fine things to say about the use of time. To my mind, the biggest problem any foreman has to face today is to properly use his time. It seems to me that every superintendent and foreman should have a time for inspection, for analyzing and studying the records of each department—records in themselves are of no value unless we make use of them. This morning we are here to take up a study of better goods from the viewpoints of the card room, the spinning room, the weave room, and the cloth room." He then presented L. L. Brown, superintendent of the Clifton Cotton Mills, at Clifton, S. C., who presented the following paper on

Opening, Mixing and Picking.

"The subject assigned to me by the program committee—'The Relation of the Opening Room and Lappers to Better Goods'—is a subject that up to a few years ago has been sadly neglected by the most of us. The relation of the opening room and lappers to the finished goods is most vital.

"I consider the picker room the foundation of the mill for it is there that our work begins. If the lap comes to the cards even and the stock well mixed and clean, the card can function as a card should and not play the dual role of both picker and card.

"We have discussed at length in these meetings the subject of ageing cotton. It is the consensus of opinion that for cotton to be properly aged it should be run through some good opening machine that has air suction and the cotton thus left in a fluffy condition for several days. There is no doubt that cotton thus conditioned will regain its natural twist and moisture and is much easier cleaned and spun. But it is for the mills on the finer counts that this method of conditioning is possible. The mills on the coarser counts are handicapped by the lack of room. Therefore, for the most of us it is necessary to lay aside the idea of ageing and try to get the cotton from the bale to the finished lap in the quickest possible time. Common sense tells us that the more bales we can lay down at the same time the better the mix, and I believe that most mills can put down a day's run at a time. When this is done and each bale gradually used the mix won't be far wrong. But it is just as important to see that your outside man gives the opening room the same grades of cotton day after day.

"Our system on this is as follows: The picker room foreman has a schedule showing him just how many bales of the different grades he is to use in his mixture. At the end of the day he makes out a list showing first how many bales of the different grades he has on hand and second, how many bales of the different grades he needs for the next day, and gives this list to the outside man. This enables the outside man to keep the opening room properly stocked, and not all good cotton one day and bad the next. If you run several different grades of cotton, say from good middling down to low middling, and all kinds of tinges too, and haven't a good system in your opening room, go stand in front of your warpers and see how many different colors of yarn you are making.

"The next thing after the proper mixture is to clean the cotton and put it in lap form with as little damage to the fiber as possible. This in a great many mills is being done by the aid of vertical openers, slower beater speeds, fewer processes and ball-bearing equipped aprons and evener motions, etc.

"One thing that we all are interested in is to get the cotton the cleanest possible with the least damage to the fiber. We know that the more picker processes we use and the more licks we give the cotton the cleaner it will be, but we also know that in so doing we injure the fiber.

"Some years ago we found that two processes of drawing were better than three, and so today we are finding that two processes of picking where we have the proper opening and the strength of yarn is a consideration, is better than three.

"The vertical opener is today, I think, the greatest aid we have in the opening of cotton and also it is very efficient in cleaning the cotton with practically no damage to the fibers. Single vertical openers have been in use for several years, but only recently have they been installed in tandem, that is, two or three in a line and the cotton passing through the complete set. It is surprising how much dirt, leaf and short fibers these machines will take out. The vertical opener when first built with the stationary perforated screen was designed primarily for the opening of the cotton, the cleaning was secondary, but today the vertical opener with an adjustable grid bar plays as great a part in the cleaning of the cotton as in the opening.

"Three months ago at our No. 3 mill which is on print cloths, we installed three vertical openers in tandem, and the results have been very gratifying. We have found the following advantages:

"Cotton better opened. Can use a slightly lower grade of cotton and obtain the same quality of work. Less dust in the card room. Cards doing better work for they have less work to do. Card room sweeps reduced 11 per cent. Spinning room sweeps reduced 21 per cent. Spinning room scavenger roll waste reduced 10 per cent. Breaking weight on 29s warp brought up from 56 to 59.

"We have found the following disadvantage: We have had to change men in the opener room three times in two months. These men weren't fired but quit, reason for quitting: too much durn dust cleaning out vertical openers, but we have now secured a gas mask and have obviated that trouble.

"With our three vertical openers in tandem we have been very particular and thorough in our tests and have found the following:

"With the adjustable grid one-half open we took out in August 1.67 per cent waste and in September with the same setting 1.77 per cent waste. We are now running with the grids entirely open, but haven't the data at the present time for an entire month. However, I will give herewith some tests of individual bales with the grids wide open.

"Grids one-half open strict middling cotton shows the following waste extracted: 1st V. O., 1.03 per cent; 2nd V. O., .44 per cent; 3rd V. O., .32 per cent; total 1.79 per cent. Grids fully open strict middling cotton shows the following: 1st V. O. 1.47 per cent; 2nd V. O., .79 per cent; 3rd V. O., .40 per cent; total, 2.66 per cent. We have extracted of low middling that was very trashy a total of 4.25 per cent waste.

"Below I give the results from another mill, data for which was taken over a period of a week's run, with strict middling cotton 1 1-16 inch staple: 1st V. O., .89 per cent; 2nd V. O., .74 per cent; 3rd V. O., .59 per cent; total 2.22 per cent.

"I have with me several samples showing the cotton before and after passing through the vertical openers, also samples showing the character of waste from each vertical opener. You will note that the sample from the second and third machines looks almost as trashy as that from the first but by weight it is a good deal less, this being due to the fact that the sand comes out in the first machine.

"I would like to quote part of a letter from a mill making hosiery yarns that have revamped their picker room: 'After putting in vertical openers, Buckley cylinders, evener arrangement, feed regulators, and cutting out our immediate process of picking, we found it necessary to take out twist on slubbers, intermediates, speeders and spinning frames. As you know, in hosiery yarn a soft yarn without kinks is desired, and only sufficient breaking strength is required to keep from breaking down in the winding or knitting. After we changed the twist our yarn broke on an average of 10 per cent higher than before. When we completed the foregoing changes we had 12 different mixes of cotton and cotton mixed with waste. And it was necessary to take out the twist on all processes and on all mixes so there is hardly any chance that anything other than the change made in the pickers could have caused the increased strength.'

"Lack of time, as we are only allowed ten minutes, prevents me from going further into details of this important subject of opening and picking, but I will be glad to answer any questions or to give any information that I have.

"I believe that it's through these discussions, born of the Southern Textile Association, that we have made such rapid strides in all branches of our industry."

Practical Discussion.

Discussion of opening, mixing and picking was called for following Mr. Brown. Inasmuch as Mr. Brown's paper had dealt more particularly with the use of vertical openers, especially in tandem use, the trend of the discussion was along these lines. Questions were asked concerning the total amount of waste removed through the use of this equipment, and the reply was that this varies under different conditions. Replying to the question, "What is the difference in waste with the vertical openers in tandem and single?" Mr. Brown said more waste was gotten out with the tandem arrangement. "We have an inclined trunk and find that we now take out considerably less waste in it. We were taking out 500 pounds a month, and with the vertical, we get 450. On the cards we kept the finished lap exactly the same and the cards did not show as much waste taken out as before. In the entire card room before we were taking about 3.6 per cent waste; afterwards, 4.6 per cent so we are taking out one per cent more waste and yet the vertical opener shows 1.2 per cent."

Asked about the speeds of his openers—run three in tandem—Mr. Brown replied that the speed of the first is 771 r. p. m.; second, 550 r. p. m.; and third 440 r. p. m. The question of the amount of staple taken out was brought up in relation with the setting of the grids. Mr. Brown agreed to try to develop further information regarding this.

In this connection he pointed out that his spinning room sweeps were reduced 20 per cent, which was achieved by the taking out of more short fibers in the opening equipment. He was asked the style of his grids, and explained that these were the adjustable type, with four sets and a V-shaped screen.

The question of beater speeds was discussed briefly, and Mr. Brown was asked if in reducing his beater speeds he reduced the beats per inch. "We did that some time ago," was the reply. "It wouldn't do you any good to reduce the beater speed unless you reduced the beats per inch. In other words, you slow your production down and get the same results and get the same number of licks."

Marshall Dilling, chairman of the Board of Governors, asked, "What percentage of waste did you get before and after, that is the total waste throughout the mill?"

"I can give it only through the card room," was Mr. Brown's reply, "that is as far as I have it this far."

Relation of Spinning to Better Goods.

The next subject to be taken up was that of the relation of the spinning room to better goods, and a short paper on this subject was presented by J. B. Harris, superintendent of the Greenwood Cotton Mills, Greenwood, S. C. This paper follows in full:

"When requested to talk for a few minutes at this meeting on the 'Relation of the Spinning Room to Better Goods,' I thought of trying to prepare a paper that would cover every detail of the management of a spinning room with especial reference to the causes and prevention of uneven yarn. After considering the matter, I reached the conclusion that it would take more time than we have today to enumerate in detail the many 'little things' that affect the quality of yarn during the process of spinning.

"As the limited time we have will not permit of a lengthy discussion, I will refer very briefly to a few of the things that must be looked after if we are to produce the good, even yarn that is so essential to 'Better Goods.' Among the most important is, the amount of drafting that shall be done in the spinning room. This will, of course, depend to a certain extent upon the amount of drafting you may be able to do, or may want to do in the card room.

"I will not undertake to suggest how much you should draft in the spinning room on the various numbers being spun, as you gentlemen with your knowledge of the local conditions in your mills are better able to determine that than anyone else. I will say, however, that it is my opinion that bad running spinning, resulting in bad, uneven yarn, is sometimes caused by too much drafting in the card room, as well as in the spinning room. A good many mills have found that they can run with considerably less twist than was once thought necessary. I have in mind a mill that is running four teeth less twist on 30s warp than was formerly run. The yarn is as strong, and their work runs as good as before the change was made.

"If the many 'little things' that must be looked after to properly manage a spinning room are looked after, you can run close around standard twist and get a good, even yarn that will help a great deal toward making the 'Better Goods' we are trying to make.

"We all know that in order to produce even yarn a spinning frame should be periodically leveled and lined, the rolls cleaned, the spindles, rings, and guide-wires properly set, and the spindles, rolls, etc., regularly oiled. But do we see that this work is done?

"We know further, that blunt or worn roving skewers and loose or broken steps put undue strain on the roving We also know that bad top rolls, roving traverses that are not working, worn saddles, levers, or lever screws, or levers resting on boards, will cause uneven work. We know these things, but do we see that they are properly looked after?

"Upon taking charge of a spinning room once, I remember finding one section of filling that had been, and was then causing lots of trouble. I found that the section men had been turning over the rings wherever they found one badly worn until new rings and old ones were mixed all over the job, and they were using the same weight travelers on both. You can readily imagine the result of such a mixture. In another part of the same room I found new rings that had been running for several months which had not been cleaned at all, and where no changing of travelers was being done. Lack of attention to matters of this kind has caused lots of bad work.

"Passing to the spooling and warping for a moment, we find another place where the 'little things' must be looked after. A few thread guides on each frame set too wide, letting through slubs, gouts, loose threads, etc., and a few set too close, straining and 'skinning' the yarn, will make a material difference in the quality of it. A little time devoted to seeing that your warpers stop when a thread breaks, and that the slack roll is working smoothly and preventing kinks, is time well spent.

"Many meetings similar to this one have been held since the Southern Textile Association was organized. At each of these meetings we can learn something worth while to us and our employers if we are looking for it. This is particularly true of the sectional meetings. The benefit our employers derive from the new ideas and new methods we learn here, will depend on our putting them into effect in our respective mills. Some times our new ideas and new methods do not work out as well at first as we expected, and we become too easily discouraged and slip back into the old rut.

"If there is any one thing that I consider of vital importance in 'The Relation of the Spinning Room to Better Goods,' it is that the spinning room be in charge of a man who is willing to look after the 'little things,' who is wide awake enough, and energetic enough to keep up with what the other fellow is doing, and who has 'stick-to-it-iveness' to follow up bad work until the cause of it is removed."

When discussion on spinning was called for, one question was asked by Mr. McCombs: "If you were going to have to use what might be termed an excessive draft in the card room or spinning room **in order** to produce an even yarn, would you rather have the draft a little excessive in the card room and short in the spinning room, or short in the card room and long in the spinning room?"

"Mr. Harris replied, "Mr. McCombs, that is a question that local conditions would govern largely. There are lots of things that would enter into that—the kind of cotton, the condition of the machinery, etc. However, I hardly think I would make it excessive anywhere. I would proportion it correctly through the whole mill. I believe if that is done it would not be necessary to have it excessive anywhere."

W. B. Williams, overseer of weaving at the American Spinning Company, Greenville, S. C., next discussed the

Relation of Weaving to Better Goods.

His paper follows:

"When I was asked to talk for a few minutes to this convention on the relation of slashing and weaving to better goods, I came to the conclusion that it was better to present to you practical thoughts that we can put into use each day, rather than to come to you with theory, so what I will have to say to you will be along practical lines gathered by experience.

"We will take it for granted that the warper beams delivered to the slasher are filled with an average good yarn, reasonably clear of knots and gouts, the yarn having received proper attention in each process put through.

"Slashing is a process of running threads from a number of beams onto one beam, with the threads going through the size vat and around the drying cylinders in the interim. In the slashing of warps I will call to your attention some things of importance; first, sizing and drying; second, tension; third, the lease.

"A good size can be made of a mixture of water, starch, gum and fats boiled together until done; the starch to fill the pores of the yarn, the gum for a binder, the fats to keep the yarn mellow and pliable.

"The cloth to be woven should be considered when we make up the formula for size. Size of the right body for 64/60s is too light for 72/76s and size that is suitable for 72/76s is too heavy for 64/60s. Warp should be dried as near the point as possible where there is not any more moisture than is natural in starch; of course, this is to be governed by the feel of the yarn. I am told that the natural moisture in starch is around 10 per cent. Too much moisture left in the warps will cause the starch to lose in efficiency and shed even before the warps will mildew.

"The tension has an important place in 'better goods.' It is best to have cylinders fitted with ball or roller bearings so they will turn easily. Then the yarn should only be run with tension enough to insure the turning of the cylinders. It may be necessary to speed up the size rolls by changing the gear on the side shaft. This will cause the yarn to feed faster. When this is done it is easy to regulate the tension with more or less flannel on the delivery roll. The head friction should pull regular. A little graphite on the disc will help them. This friction should only be run tight enough to take the yarn from the delivery roll and not to pull the cylinders.

"There is another friction usually run on the two back beams of the creel, a cord or a strap with a weight fastened to one end and swung over the beam head. This weight should be hung on the side of beam that is pulling up and only of sufficient weight to hold the beams when the slasher is being slowed down.

"The lease also has its place in 'better goods,' therefore it is necessary to run the warps straight with the threads well separated. To do this I would begin by count-

ing threads in the strike comb when I lay the set in on the back of slasher. This is done to get a regular even sheet all the way across. Then have lease rods on the front spread so there will be about a four inch opening in the sheet of yarns instead of having it run straight through. This will make it easier to see anything that goes wrong with the lease.

"My opinion also is that a double comb on the front is of great help, one comb with perpendicular teeth, the other with an angle of about 45 degrees. This will eliminate any crossing of threads or changing their positions as they pass around the delivery roll and onto the beam."

An extended discussion was carried on following Mr. Williams' remarks. In connection with his statements regarding waste, the question was asked, "What is the percentage of waste caused by an uneven run-out on the warper beam behind the slasher?" Mr. Williams replied, "I am not in a position to give you that information." Then was asked, "What is the cause of uneven run-outs on the warper beam behind the slasher?"

"We probably might contribute the cause of that to uneven elasticity in the yarn," replied Mr. Williams, "or to undue friction brought on the beams. Sometimes when we get our creels on the slasher we tighten up the bearings, and there is a chance that we might tighten one more than the other, and that would give an uneven friction on one beam which could cause a run-out to be uneven. I have seen the back beam run out first, and it has been a question in my mind as to the things that cause these occurrences."

The question of whether starch should be weighed or measured was revived at this meeting, when J. S. Strowd asked Mr. Williams, "Which do you consider the more direct way of determining the amount of starch—weighing it or measuring it? Does the weight of the starch vary with the weather conditions, with the two extremes of very dry weather and very wet weather?"

"At one time, years ago, I had no place in which to put my starch, and so I carried it to the cellar," replied Mr. Williams. "I should not have done it; I was wrong. My starch had too much moisture in it, and pulverized. But with a dry place to keep the starch in, and starch with the average amount of humidity, I think the best way is to weigh it. I weigh mine at each mixing."

The next question was, "Do you lay the waste on the slasher beam on the spinner or the slasher?"

"Sometimes both might be responsible," was the reply. Beams should run to the exact number of yards, and when they have no undue friction on the creel, then I can't see where there would be any great difference." But sometimes with the same amount of yards and all other conditions alike they will not run out the same, it was countered. This was agreed to.

"I would like to ask Mr .Williams if he thinks that the distance from the back beam would give the yarn more space to stretch," requested a mill man.

"I do not think there would be much difference," was the answer, "because the back beam runs over the next beam to it, and the stretch is not any more unless it slips."

Mr. Crocker asked, "What would be a good percentage of waste, on 30s yarn, if 2,400 pounds of yarn are put up at the back of the slasher?

In answering this Mr. Williams stated that around 40 to 50 yards is a fair average, although he has had occasions, with spurred beams, where the waste would run up as high as 100 or 150 yards. He pointed out, however, that this latter is not an every-day condition, but with a good run-out, three or four or five pounds of waste is a good average.

He was asked if six pounds to the beam would be considered excessive. "Not too much to kick about," was the reply, but with good conditions it should be lower than that.

H. H. Boyd, Charlotte, N. C., spoke at this point, declaring strongly that he believed ½ pound per beam should be considered as a maximum amount of waste to be gotten. With four beams, he said, the waste should run around two pounds; with eight beams, around four pounds, etc. He declared something must be wrong if the waste percentage ran above that, pointing out that the tension, and the amount of stopping done by the warpers would affect this. (The discussion was on 30s.)

J. V. McCombs pointed out here that in his opinion the meeting should consider the slasher waste in yards rather than in pounds. If a man is running 40s, he explained, the ½ pound waste advocated would be a different number of yards than would be the case with a man on 20s.

Mr. Crocker at this point explained his reason for asking the question earlier in the meeting. "I am on 30s," he said, "putting 2,400 pounds of yarn at the back of the slashers, and I keep a very close account of that and I find we have between five and six pounds. My idea was to find out if that was excessive. I would like to ask of the gentlemen here how many are getting out with less." The replies indicated by the raising of hands showed that more were getting around five or six pounds than were making less.

Following out the suggestions made in his paper on spinning, Mr. Harris of Greenwood emphasized the importance in slashing and weaving of "looking after the small things." He said: "I believe that you are going to find if you investigate that the biggest amount of your trouble is on the warpers. A while ago I tried to stress the importance of looking after the little things. My experience has been that the condition of the skewers affect the amount of waste left on the beam, in this way: if the warper skewers are worn that naturally puts more tension on the yarn between the spools and the beam, which will give you a little additional yardage on the beam. Another thing: your measuring roll, perhaps, through long years of usage and service, may become uneven. An investigation will show you that that will have some effect, and a thorough cleaning of the roll will help.

"I have no doubt," continued Mr. Harris, "but that a general use of ball bearings on the measuring roll will help the matter. I also believe that a thorough looking over of the measuring roll gears would help some. I will say that I believe Mr. Boyd is about right on ½ a pound a beam, and I think you can get there if you will watch the little things on the warpers."

Mr. Williams added another suggestion in this connection: that in dressing the measuring roll, care should be taken that there is not the least difference in the circumference of the roll, as "this will make a difference in the measuring of thousands and thousands of yards."

Mr. Cameron, of Roanoke Rapids, N. C., offered a suggestion in this connection, declaring it would pay the men to keep tabs on the warp mills. He said he has been doing this lately and can now place his finger on the location of

the cause of the trouble.

"One other question" was requested by Mr. McCombs. "I would like to ask Mr. Williams if he knows of anyone who had make a check on the slasher cylinder to find out how many pounds it takes to turn it."

"Yes sir," responded Mr. Williams. He said in a test he had make on a slasher equipped with ball bearings, the cylinder was turned with a ½ pound weight.

Mr. McCombs explained that in a test he had conducted, with the old roller or truck bearings, he had found it required at the lowest, 3¾ pounds, and at the highest, 35 pounds.

In concluding the weaving and slashing discussion, Mr. Williams pointed out that "one of the important things for us to look after is to retain the elasticity and carry it to the loom. If we get a good stout warp, we can expect good results in the weaving."

The final paper of the meeting was presented by Harry W. Moseley, local manager of the Victor-Monaghan Mills in Greenville, who discussed the subject of the

Relation of the Cloth Room to Better Goods.

"The cloth room is to the mill as castor oil is to a man—it is considered an evil thing just tolerated because it has to be called upon in time of trouble or sickness. When a man becomes bilious from wrong living by overeating he will call on some doctor to prescribe a remedy, and if he is a good doctor he will advise a dose of castor oil. Just so with the mill when it becomes bilious from production and good times, when the market will for a time absorb any cloth that it makes, and allows its vitality to run down, and when the cloth room presents the monthly report with an unusual amount of bad cloth and prescribes a dose of 'quality' as a remedy, the mill has the same feeling toward the cloth room as a man has toward the doctor when he is told to take a teacup full of castor oil.

"The cloth room is not an evil as often considered by the other departments, but it is a safety valve, that must pop off at times and tell the mill they have reached the danger point in their efforts to make a record in pounds, the average worker in the mill is more concerned with the amount that he or she makes than with the quality, therefore the cloth room is for the purpose of showing to the mill that quantity and quality are not equal.

"I feel like sometime asking the question 'Why the cloth room?' It is not listed in the cost sheet under labor cost, and I suppose for that reason is forgotten when the wage scale is being made and is adjusted, the cloth room is then given what is left of the amount allowed for labor cost in the mill. I think the man or woman who in the day's work handles thousands of dollars worth of cloth, inspects and grades and puts it in a condition for the buyer, is worth as much to the mill as one who weaves a few hundred yards of cloth a day. If the inspectors and graders are put on a basis with the quill cleaners and waste haulers, they will naturally have the same interest in their work.

"Each department in the mill has the one following to correct its imperfections, until the cloth room is reached. It has the final look at the cloth, and, as the water that has passed through the water wheel is lost forever, an imperfection that escapes the vision of the inspector or grader is gone, and will result in trouble for the cloth room when it reaches the buyer.

"The cloth room acts as a buffer between the mill and the buyer. If for some reason the work in the cloth room is indifferent and allows imperfections to pass on to the buyer, thereby showing in the monthly report a small percentage of seconds, the management is satisfied that every part of the mill is running smoothly as it takes time for the cloth to get into the hands of the buyer after being shipped. You do not hear from it for some time, and when the cloth is inspected by the finisher, and he finds it below standard, a barrage is started from the front at once in the form of letters by the yard to the office, and at once the office opens up, and the cloth room runs up its flag calling for 'quality.' You will ask, 'why wait until then to call for quality?' For this reason: the people in the cloth room are human as well as those in the other departments, and are going to have a standard of work in their department just so good as the other departments, in this respect—the best that is produced will be classed as firsts and the mill will make the cloth just as bad as the cloth room will allow. So the purpose of the cloth room should be to create a standard that will meet the demands of the buyer, and insist upon the mill making a cloth that will satisfy the buyer and bring to the mill repeat orders. Repeat orders are what make profits for the mill, especially if the mill is making specialties; standard goods of course can often be disposed of to other buyers.

"So you will see that it is a moral question that enters into the making of a piece of cloth, the acts and character of the workers in any preceding department has its influence on the one following, so the overseer in any department who does not show by his life, good character, and good morals, cannot hope to instill into the workers the idea that better living makes for better goods.

"I believe the time is fast coming when the character of a man will be given as much consideration as his ability. An immoral man or woman may for a time get by with a good production and quality in their work, but they are just like a machine that is not properly cared for; they are both going to break down too soon, and it costs money to replace men and machines. A man of bad morals has nothing to offer as a panacea for the bad morals of others. A poor section man cannot keep a machine in good condition. Therefore, I believe the executives of our mills will look more and more to the moral side of the work, and immoral men or women cannot give a good day's work. You may point to some one that will disprove this statement for a time, but just analyze your payroll and find the best workers and find how they live out of the mill, and I think you will soon be convinced that the man or woman who has character and good morals is the one who gives you the best results.

"The cloth room overseer must be a man who will instill into the workers in the room the fact that the work they do must be above suspicion, doing justice to the mill and to the buyer. It is often a hard task, for you are often confronted with demands of the buyer that are unjust, as well as from the mill. The cloth room is often damned if it does one thing and damned if it does another.

"What knowledge has the average worker of the finishing or bleaching processes necessary to put the cloth they make in proper condition for the consumer? I would like to know how many overseers, second hands and section men have ever seen inside a bleachery. Until the finisher and manufacturer can meet on a common ground and arrive

at a fixed standard, the cloth room is in that unhappy position of having to meet the demands of the finisher if there is any business done. Without buyers the mill cannot run.

"The cloth room man must have a knowledge of where the defects that appear in the cloth come from, so that he can place the responsibility at the right place, as the average overseer is a sensitive being, and none of us cares to be blamed with things we are not resposnible for.

"The cloth room sometimes will possibly think too much of the consumer, but I think by so doing it is acting as a safety valve, thereby helping to create with the selling end a demand for the goods made by the mill, and the selling house must know that the cloth room is not trying to camouflage the cloth, but that when a piece of cloth goes out of the mill, it is just as represented in the invoice. The selling house knows full well that if the cloth does not come up to specifications he will have a hard task getting a repeat order. I think if the demand for quality would start at the opening room and continue on through the several departments, the question of pounds will adjust itself to the satisfaction of the executive, and the cloth room would then be a pleasant place to live in.

"No two minds will be of the same opinion as to the quality of a piece of cloth, if one is a seller and one the buyer. If you do not think so, just try to sell some article and see the result.

"So if the cloth room as well as the other departments will give more thought to the character of the workers and also see that they themselves show character in their work and life in and out of the mill, the problem of 'Better Goods' will be very largely solved, and when the cloth room offers its remedy for the troubles in the mill, it will be accepted in the same way we accept the remedy offered by the doctor, even if it is castor oil. Quality and castor oil will cure a multitude of ills, if taken as prescribed.

"Let's have in mind character for ourselves, and without having to tell the workers your influence will extend to them."

Following Mr. Moseley's paper, the Association considered the subject of the place for the next semi-annual meeting. It was moved and finally decided that this decision be left to the governing officials, who will be glad to receive invitations from any cities in the South.

A Method of Accounting for Waste.

Considering the small amount of information that has been written on the subject of textile costs, those concerned in this phase of work will be interested to know that the National Association of Cost Accountants has recently issued, as an official publication, an article by George Klimmer, entitled "A Method of Accounting for Waste in a Cotton Spinning Mill."

Following a general review of the manufacturing process in the textile industry the author proceeds to develop his subject from the standpoint of simple accounting for waste. He deals only with the major processes in making carded and combed yarns. Both the value of waste percentages and the description of waste records are emphasized. Accurate determination of waste percentages provides a basis whereby the textile manufacturer may compare his percentages with that of another and so ascertain whether his own percentage is too high, or whether it is lower than others. From a standpoint of operating efficiency, the keeping of individual records of the quantities of waste resulting from each operation and the different grades of cotton is urged. A more elaborate system of accounting, for large organizations, is also presented. A number of charts, diagrams and other forms needed in connection with the working out of these systems are given, and the writer, in conclusion, outlines the results that may be obtained from a proper system of accounting for waste. Copies of this publication may be obtained from the secretary, National Association of Cost Accountants, 130 West 42nd Street, New York. The price to non-members is 75 cents a copy.

Morse Chain Company announces that due to increasing business it has become necessary for the Philadelphia office to secure larger and more desirable offices, and the headquarters of the company in that city have been removed to 612 Franklin Trust Bldg., 18-22 South 13th Street. J. E. Meaney is the Philadelphia district manager.

Joseph H. Bennis, vice-president and sales manager of the New York & New Jersey Lubricant Co., New York, manufacturers of "Non-Fluid Oil," returned on October 1 from a three months' trip abroad, during which he visited textile mills in England, Norway, Denmark, Belgium, France and Italy. Mr. Bennis reported "Non-Fluid Oil" to be firmly established with the textile and other industries in these countries, and a substantial increase in its use is looked for as a result of his trip. Mr. Bennis stated that the mills in the countries visited are recognizing the decided advantages which result from the use of this type of lubricant in the place of old-fashioned liquid oils and greases While in England Mr. Bennis spent some time with Dick Thomas, well known as former southern district manager for Sykes Brothers Company, who asked to be remembered to his friends in the southern section.

STATEMENT.

of the ownership, management, circulation, etc., required by the act of Congress of August 24, 1912, of COTTON, published monthly at Dalton, Ga., for October 1st, 1922.

State of Georgia, County of Fulton.

Before me, a Notary Public, in and for the State and County aforesaid, personally appeared W. J. Rooke, who, having been duly sworn according to law, deposes and says that he is the Business Manager of COTTON, and that the following is to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 443, Postal Laws and Regulations, printed on the reverse side of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, W. R. C. Smith Publishing Co., Atlanta, Ga.; Editor, L. L. Arnold, Atlanta, Ga.; Business Manager, W. J. Rooke, Atlanta, Ga.

2. That the owners are: W. R. C. Smith, Atlanta, Ga.; E. P. Smith, Atlanta, Ga; W. S. Cushion, Cleveland, O.; O. A. Sharpless, Atlanta, Ga.; J. C. Martin, Atlanta, Ga.; H. H. Kelley, Atlanta, Ga.; W. J. Rooke, Atlanta, Ga.; T. W. McAllister, Atlanta, Ga.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or any other security holders are: None.

4. That the two paragraphs next above giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders, and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bonafide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. W. J. ROOKE Bus. Mgr.

Sworn to and subscribed before me this 1st day of October, 1922.
(Seal) JOHN C. MARTIN.
Notary Public.

My commission expires June 20, 1924.

Fifth Southern Textile Exposition

The universal opinion of the Fifth Southern Textile Exposition is that it was a most satisfying and effective Show. Greenville was at her best, the weather was ideal, the exposition was staged most admirably, and everyone went home happy and pleased. The Show was held in Textile Hall, Greenville, S. C., from October 19 to 25 inclusive.

Textile Hall, the home of the Exposition and the scene of the event this year was elaborately decorated, and, with a special lighting equipment installed for this show, presented an appropriate setting for the affair. The splendid decorative effect, together with the harmonious arrangement of the individual exhibits, lent to the Hall a most attractive and beautiful appearance.

One feature of the Show this year was the large number of new devices, improvements and machines which were on display. A number of these we described in the October number, and stories of others will be found later. This feature pointed unmistakably to the development in textile manufacturing equipment which has taken place within the last several months, and, from the other standpoint, it showed the effectiveness of the Exposition as a medium for presenting to the mill men those items on which actual, personal demonstration plays such an important part.

In addition to the strictly new equipment shown, other manufacturers were on hand with improved models of previous types of machinery and devices which constituted an interesting part of the Show. Each Show brings new ideas from the manufacturers, new suggestions from the mill men; combining these and considering all the other factors, progress in the industry comes inevitably and rapidly.

Another feature of the Fifth Exposition was one which gave the exhibitors practical satisfaction as to their displays. Favorable comments were heard in all parts of the hall regarding the wholesome interest that was manifested by the visiting mill men. While it was unanimously agreed, or practically so, that an Exposition should possibly not be expected to develop actual orders and business, at the same time, reports were made of a number of actual sales of equipment and machines in surprisingly large volume. Equally as satisfying, however, were the large number of inquiries received which evidenced an interest by the mills in the equipment, and pointed the way to the development of better things.

Then of course there was the social side of the affair, which cannot be advisedly omitted from any gathering, much less a Southern Textile Exposition. Means was provided for the renewing of old acquaintances and frindships, and the forming of newer ones, and much valuable information came from the discussion of subjects of mutual interest between the exhibitors and the mill representatives.

Still another feature that received favorable comment was the arrangement of the dates for the Show this year, allowing the former continuous stretch of activity to be broken this year by Sunday as a day of rest. Various parties were gotten together for sight-seeing trips over the week-end, while others utilized the breathing spell for the purpose for which the day was intended—rest.

The Show was opened at 10:30 o'clock Thursday morning, October 19, by President William G. Sirrine. Following a musical presentation by the Greenville Chamber of Commerce quartet, Mayor H. C. Harvley welcomed the visitors in behalf of the city, and Governor Wilson G. Harvey, of South Carolina, spoke briefly in behalf of the state. The governor was introduced by J. A. Russell, president of the Greenville Chamber of Commerce. Chester I. Campbell, the general manager of the International Textile Exposition at Boston, who was a visitor to the Exposition, was called upon by President Sirrine, and brought words of greeting and congratulation from the Eastern Show. This was Mr. Compbell's first visit to the Southern Textile Exposition, and he expressed pleasurable surprise at the progress and importance of the southern show.

On Thursday afternoon, a reception to the exhibitors was held at the Sans Souci Country Club from 4 to 6 P. M. This began a delightful scheme of entertainment presented by the Greenville people in honor of the visitors.

Friday and Saturday, October 20 and 21, were truly "Mill Men's Days" at the Show. On these dates the Southern Textile Association held its regular semi-annual meeting in Greenville in connection with the Exposition, thus bringing a large number of superintendents and overseers and other operating executives.

An Inter-City Luncheon was given on Monday by the Rotary, Kiwanis and Civitan Clubs of Greenville to the visiting members of these clubs. M. L. Brittain, president of the Georgia School of Technology, Atlanta, Ga., was the speaker of the occasion.

The Cotton Manufacturers' Association of South Carolina convened in their regular semi-annual meeting in Greenville on Tuesday, the 24th, with two sessions, at one of which Senator N. B. Dial of South Carolina was the speaker. An informal dance at the Sans Souci Country Club was held on Tuesday evening complimentary to the exhibitors and the members of the Association.

On Friday night and Monday night, the 20th and 23rd, dances were held at Cleveland Hall following the closing of the day at the show, complimentary to exhibitors and mill men, at which music was furnished by the Garber-Davis orchestra.

A handicap golf tournament was staged at the Country Club on Tuesday afternoon, Harold Le Roy Van Zandt winning the cup for low gross score, and R. E. MacCausland taking the net score prize.

And so the week was a full one, and 10 o'clock Wednesday night, October 25, brought to a close the most successful Southern Textile Exposition thus far held. Everybody was there and saw everybody else, and all were pleased. Another feature which must be mentioned before closing this account was the diversified nature of the various exhibits, and, certainly, it would be the acme of negligence not to mention and commend the most efficient way in which the various committees contributed their portions to the success of the event. Not least among these was the work of the housing committee, which operated so efficiently, and placed so comfortably in those splendid Greenville homes many of the visiting exhibitors.

Haring & Stephens Co. 15-27 Kentucky Ave., Paterson, N. J., have taken over the extractor business of the East Jersey Pipe Co.

South Carolina Mill Men Meet

An extended address by Senator N. B. Dial of South Carolina, and an excellent report from President James D. Hammett, were the features of the semi-annual convention of the Cotton Manufacturers' Association of South Carolina, held in Greenville on Tuesday, October 24, in connection with the Fifth Southern Textile Exposition.

The first session was held in the Grand Opera house at 12 o'clock, at which Senator Dial spoke. After an intermission for luncheon, the Association re-convened at 2:45 o'clock in Cleveland Hall for the afternoon session, when the report of President Hammett and the committee reports were presented, following which the convention went into executive session for the election of officers and other business.

The interest of the manufacturers of the state in their Association was manifested in the large attendance at this meeting, three-quarters of the member mills being represented by one or more delegates. The importance of the Association work was developed in the reports of the president and the various committees on traffic, education, and other matters, which showed the extent to which the Association is assisting in the development of the industry of the state.

JAMES D. HAMMETT, RE-ELECTED PRESIDENT.

The First Session.

Senator Dial's speech constituted the major portion of the first session. The meeting was presided over by President Hammett in his usual able manner. Rev. Frank Juhan of Greenville opened the meeting with an invocation, after which Senator Dial was presented by the chairman.

The senator's speech was divided into two separate divisions. He spoke for about two hours, and in the first part of his speech, launched an attack upon administrative inefficiency and incompetency in Washington, making an appeal for the business men of the country to wake up and take an active and continuous part in the operation of the government's affairs. During the second part of his speech, he dealt with the cotton futures act of which he is the author, scoring the present methods as inequable and unfair.

The first order of business at the second session, held in Cleveland Hall, was the roll call, which was followed by the report of the auditing committee consisting of R. E. Ligon and J. P. Gossett, which showed the affairs of the organization to be in good order.

Next came the address of the president, Mr. Hammett. This was presented in the usual completeness and thoroughness of the speaker, taking up the condition of the industry through the past twelve months, emphasizing the abundance of labor supply, and other matters of interest. He stressed the importance of the transportation division of the Association and the work it is doing in the interest of the mills. He discussed taxation and legislation of interest in South Carolina, and pointed out the danger of an ignorant, uninformed, prejudiced public sentiment against corporate wealth. Other matters discussed were education, cotton production, etc. His address follows in part:

President's Address.

The twelve months covered by the fiscal year of your Association has been one of uncertainty to all manufacturers and the time has been used largely in holding organizations together and with every effort to give employees the maximum of employment so as to avoid suffering among our people as best we could. As a period for earning dividends we cannot truthfully point with pride to results; yet we as one of the large industries employing thousands of men and women, do take pride in the fact that we have demonstrated our earnest efforts to manage so that the men and women, (120,000 employees and dependents on employees and representing 15 per cent of the total white population of the entire state) should have an opportunity to earn a sufficient sum to avoid suffering and to enjoy many of the luxuries of life.

Labor has been abundant, and at the moment the indications are that more labor will be available than can be economically used. This condition has been, to a large extent, brought about because of the ravages of the boll weevil added to an unfavorable growing season. While it is pleasant to have available an abundant labor supply, we must not overlook the fact that the migration of the farmer to the mills will ultimately result in a lessened cotton acreage in the immediate vicinity of the mills, and that an additional quantity of cotton will have to be brought to the mills from distant markets with the added freight charges to be carried in the cost sheets.

Labor has been more active and effective in producing a maximum of production, and in many cases has grasped the idea that mills were operating with practically no profit,

and in cases with no profit at all; consequently the thinking element of employees have been disposed to add their energies, to assist in making possible the unbroken operation of the plants. The wage scales have not been changed during the year, though business was unprofitable. While our friends and competitors of the East have been through an unpleasant labor disturbance, the thinking southern operative has realized that southern mills furnish comfortable homes at a rental that will not exceed twenty-five per cent of the rental for homes at many eastern mill centers, and, in addition, are furnished fuel at cost, and often at a loss to the mills, and that sentiment has not been altogether discarded by the southern mill officials, but, on the other hand, a sympathetic feeling, and often an affectionate regard exists between the executive and the employee.

The question of power, whether electrical or steam driven, is of paramount importance to the industry. The fuel problem is dependent oftentimes on labor conditions in the coal fields, and as has recently been the case, considerable embarrassment has been felt by many mills, and we have suffered the unpleasant experience of having contracts made in good faith ignored, and exorbitant prices for coal charged to mills who had to "stand and deliver," or else close their plants, and leave without employment and the means of earning a living large numbers of industrious men and women who should not be subject to such hard ships as is now possible. As an antidote I strongly urge the powers in control, and the people generally, to give such consideration as will insure a gradual development of sufficient electrical energy as to operate all the industries of our state, and relieve the uncertain and unhappy conditions existing because of our dependence on the coal fields and the transportation lines.

Another decided movement was made to enact a 48 hour labor law at the last session of the legislature, and while the bill was passed in the house the senate wisely substituted a 55 hour bill which became a law. As an industry we condemn the disposition to place the textile interests of South Carolina in position where competition with our coworkers of other states would be difficult, if not indeed impossible. Massachusetts alone has a 48 hour labor law for its textile interests, and it is a notorious fact that extension of the textile industry in New England is no longer thought of. The thinking element of the employees in South Carolina mills join with the management of the mills in urging that we be left to conduct our business without further restrictions, and that sentiment be changed so as to secure a continued extension of the textile interests in the state, to the good of the state and all its people. Taxes are burdensome, and something must be done or else South Carolina will be compelled to sit idly by and see other states forge ahead because industries are given more considerate treatment. It must not be understood that the textile interests are opposed to an educational system, or to a good roads movement or to amply caring for its unfortunates, for we are sincere and earnest in our support of all. We do, however, urge that economy that will not interfere with efficiency be practiced and that we be not called upon to carry such an undue proportion of the burden.

There has developed a sentiment among a class, and certainly among the ignorant class that is antagonistic to corporate wealth. They who are ignorantly opposed to corporations are unable to justify their opposition, and are not in position to realize the lamentable condition in which our state would find itself if the corporations, viz: the railroads, the cotton mills, the banks, the oil mills, and other corporate organizations were removed from the state and welcomed, as they would be, in sister states. It is a reflection on the intelligence of a people to antagonize and seriously injure, if not destroy, an industry that furnishes honorable and lucrative employment to 15 per cent of the white population of the state, pays its full share for the education of the youth of the state, and the upbuilding of the highways of the state, and in every way adds its full quota to the wealth and happiness of all the people of the state.

We are urgently in favor of education as a self protection, as well as for the best interests of the state at large. We favor, and willingly assist in supporting the higher institutions of learning, and would protest against any curtailment of their usefulness. We are, however, intensely interested in the grammar and high schools of the state and feel that ample support should be given them. Certain departments of the educational system could, in my judgment, be dispensed with in the interest of economy, in that it is questionable whether results justify the expenditure. The funds used in these departments could be diverted to the grammar and high schools to the further effectiveness of these schools, and relieve the state of the necessity of supplying additional funds so that progress may not be arrested. As an evidence that textile interests are awake to this important subject we quote from the Statistical Atlas of South Carolina, prepared by the educational department of the State Government for 1921. "There are 185 cotton mills in the state, 169 of these are paying a special school tax ranging from three to nineteen mills, to say nothing of school bonds. The sum of $1,068,000 is a conservative estimate of the amounts contributed by the mills of the state for the past year over and above their regular taxes, not counting any items of less than one thousand dollars. This was spent for buildings, equipment, teachers salaries, janitors, fuel and incidentals." These figures are only an indication of the intense interest felt by the mills toward this important subject.

Cotton production is a subject that we naturally are much interested in seeing solved. With the weevil damage, and other interferences, the supply of cotton is becoming dangerously low and we gladly support any agency that has merit to it that will increase the supply to safe proportions. We are in sympathy with the cooperative association in its efforts to spread the sale of a crop over the larger portion of the year rather than have the entire crop sold in the first quarter of the year. Our sympathies are with our farmer friends, and are antagonistic to any who may attempt to depress the price of cotton below a point that makes its production a profitable one to the landlord and the laborer. We trust we may be pardoned for suggesting that nothing is gained by appeals to sentiment and to extravagant statements as to production costs. The fact is that the supply and demand always has, and always will, control the price in the end, and that business principles demand that cotton be produced in as nearly the quantity needed as is possible in an economical way, looking towards the greatest number of pounds per acre, so as to reduce the cost per pound.

In conclusion I wish to express to each member of the committees, and to the membership of the Association as a

whole, my sincere appreciation of the courteous and charitable way in which you have received me during the year just past, and to urge that you renew your approval of the Association work, and give to the Association your unstinted and loyal support in the years that are before us.

On motion of Captain Ellison A. Smyth, the Association voted appreciation and thanks to its President for his report. After this the convention went into executive session, and the following list of new officers were announced: President, James D. Hammett, Anderson; vice-president, Emslie Nicholson, Union; secretary-treasurer, Robert W. Sullivan, Anderson; executive committee, J. H. Morgan, Greenville, Dr. H. A. Ligon, Spartanburg, R. B. Pitts, Camden, W. C. Hamrick, Gaffney, J. C. Self, Greenwood, and Geo. M. Wright, Laurens; the chairmen of the various committees to act with the executive committee ex-officio.

Metal Partitions for Industrial Plants

The subject of factory welfare and hygiene, as relating chiefly to employees, has many phases. Along with cafeterias, scientific drinking fountains, and locker, wash, and rest rooms, has come a real improvement in employees' toilets.

One manifestation of this is seen in the increasing use of metal as a material for the toilet partitions or compartments. Marble, of course, has until recently been considered the finest material obtainable for this purpose, but its cost has always proved prohibitive for ordinary industrial installations— and indeed for any but the highest grade work in any class of buildings. Marble, and slate also, though strictly sanitary in themselves, cannot be installed without the objection of numerous cracks and crevices where dirt and germs may collect. Wood, the material most commonly used in the past, on account of its relative cheapness, was anything but sanitary, and not very durable, especially under the constant condition of moisture.

Since the comparatively recent advent of the metal toilet compartment, metal has proved from every standpoint to be the ideal material. It can be built into toilet, urinal, and shower partitions and dressing rooms without cracks, practically rust-proof, neat in appearance, and highly sanitary. And its cost is moderate.

Among the pioneers in the manufacture of equipment of this type is R. F. Carpenter of Cleveland, Ohio. As president of a company well known in the metal products field, Mr. Carpenter has had experience in the metal building equipment business and is regarded as an authority in this line.

Since the inception of the metal idea as applied to toilet and general factory partitions, Mr. Carpenter has been a close student of factory sanitation as it relates to his particular product, and has taken an aggressive part in what has amounted to a national movement toward better toilet facilities for factory workers.

"The business of manufacturing toilet partitions," says Mr. Carpenter in a recent interview, "may seem about as prosaic and uninspiring an occupation as anyone could well engage in. And yet, entirely apart from the fact that we have succeeded in building up a very substantial business, I have myself developed a keen personal interest in the extension of proper toilet accommodations all over the country, particularly in industrial plants.

"In all public or semi-public toilets the problem of contamination from venereal disease will unfortunately be with us for some time to come. That is unavoidable. But, through negligence and disregard of even the primary principles of saniation, to allow the toilet room to become a place for the multiplication and spread of such germs, is little short of criminal.

"That the modern manufacturer and factory executive could easily, with a little educational persuasion, be brought to appreciate the advantage to him of equipping his employees' toilets in a sanitary manner, was a matter of very small doubt to those of us who had investigated the situation. And the results of the last few years' work in this respect have thoroughly borne out the conviction. Very few plant owners or executives responsible for equipment will now consider anything but a first-class metal toilet for new buildings, and a large proportion of them have refitted the rooms in old plants with modern compartments. That these improvements have abundantly paid out in employee morale as well as in a humanitarian sense, any executive who is a student of labor efficiency will tell you.

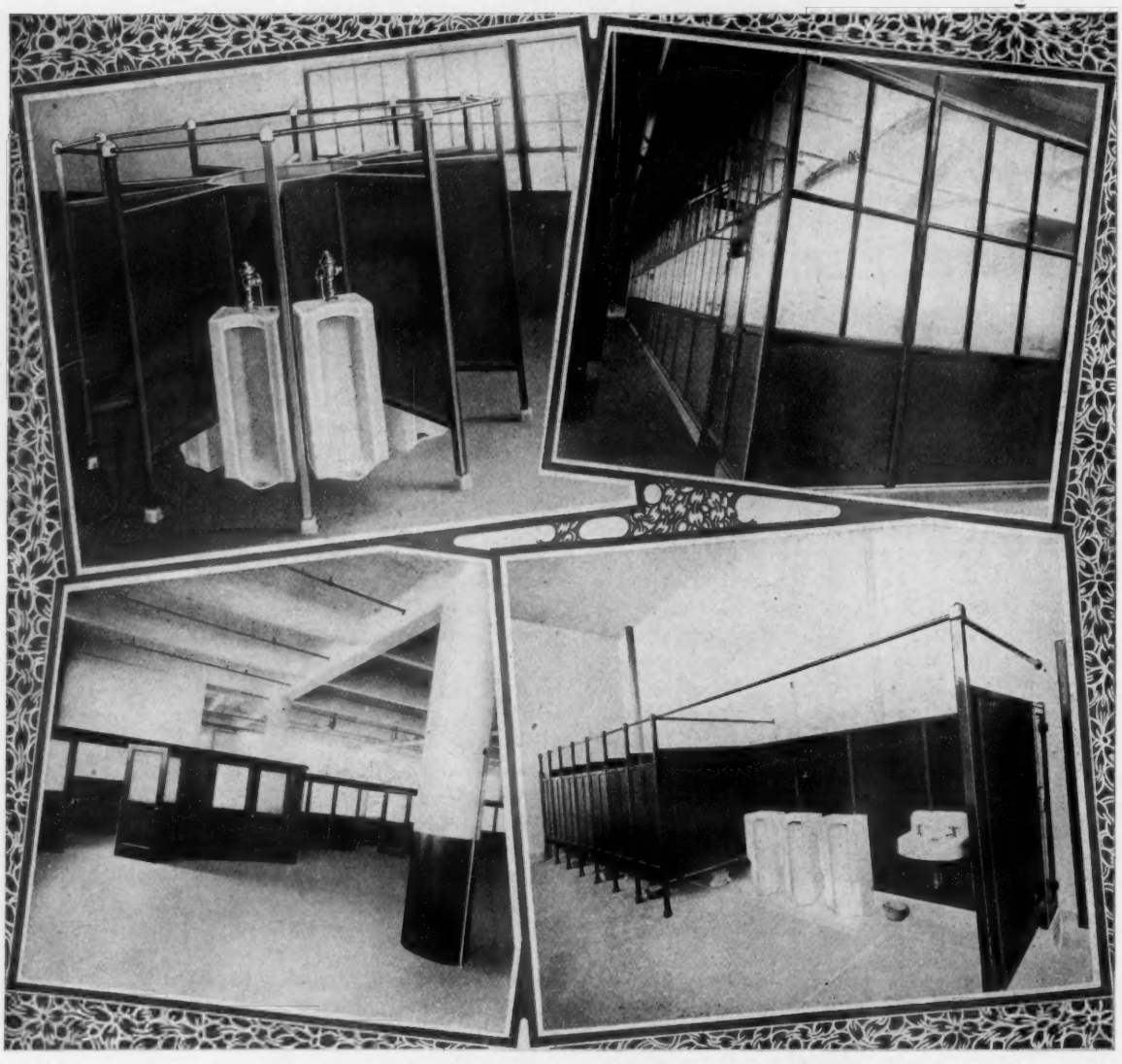
"The fact that most textile mills represent a character of industrial plant distinctly above the general average in every way, together with the kind of paternal employee supervision exercised in many cases in the South, where the whole community centers about and is dependent on one great plant, has made the textile field unusually receptive to improvements of this nature. This accounts for the fact that so large a proportion of our products are now giving service in the southern and New England mills."

"Sanymetal," the patented partition which Mr. Carpenter has brought to its present perfection, is in itself a special-analysis, rust-resisting metal. Every detail in its manufacture into a partition is also carefully protected against rust. Thorough spot welding, slant-lip molds, water-shedding base shoes, and heavy baked enamel metal furniture finish illustrate this point. Even the castings, hinges, and every piece of hardware down to the last bolt is put through a special "electric-zinc" plating process which has stood the government rust test.

The compartments are constructed in standard unit sections adaptable to any desired room space or dimensions. When set up they form a perfectly rigid and extremely durable installation, good for the life of the average building under ordinary service conditions.

In connection with designing and perfecting the manufacture of the partitions and doors, Mr. Carpenter originated and patented the first gravity roller hinge for self-acting doors. This hinge is noiseless, springless, and almost impossible to wear out. Mr. Carpenter also brought out an ingenious "U-Channel" for the adjustment of partitions to irregularities in the walls of the building.

In addition to the development in toilet partitions, the last three of four years has seen the actual opening up another field almost as virgin as that of toilets, the metal office and shop partition field. For entirely logical reasons, metal is coming more and more into general favor for office partitions. A high class job of wood partitions was expensive and required the services of expert craftsmen.



SOME RECENT METAL PARTITION INSTALLATIONS MADE BY THE SANYMETAL PRODUCTS COMPANY OF CLEVELAND, OHIO.

It was easily battered up or splintered and necessitated frequent refinishing to avoid a shabby and aged appearance. It was also certain to open up at the joints and provide ample lodging places for vermin.

, The use of metal with baked enamel finish provides a far more durable partition, and one more easily and thoroughly cleaned. Its impervious finish and the absence of cracks make it sanitary.

Such partitions of the office type are beautifully designed and executed to the last detail of mitre and trim, the same on both sides. Upper sections are glazed as desired. They are built in units adaptable to any required layout, and are also flexible, so that they may be taken down for changes in the floor plan, moved to a different location, and set up again just as permanently as before.

Shop or mill type partitions are somewhat simpler in detail and trim, but of the same general design and adaptability. They are well suited for general mill offices, departmental and superintendent's offices, tool, supply, and stock rooms, warehouses, etc. Glass of any type, wire glass, wire mesh, or factory steel sash with glass may be substituted for metal in any panels desired.

The elimination of fire hazards connected with wood partitions has consistently worked in favor of metal partitions of all kinds, particularly in such plants as those of the textile industry, where large numbers of employees are often concentrated in relatively limited floor space, and where a large percentage of the operatives are female. The accompanying illustration show types of toilets and mill and office partitions of metal, and indicate their fine appearance and adaptability.

Newport Chemical Works, Inc., Passaic, N. J., have announced the development of Newport Direct Fast Scarlet 8B, one of the series of Benzo Fast Scarlets. It is said to have a good fastness to light and acid, and to be suitable for use in combination shades, as well as having an application in the dyeing of union material. The manufacturers state it has a fair fastness to chlorine and is suitable for use in discharge work, giving a good clear white.

The Design and Manufacture of Fustians

BY T. WOODHOUSE AND A. BRAND.

Once the cloth has been woven, it is customary and indeed essential, to subject it to a rigid inspection, and to repair, as far as possible, any defects found during the process. For this purpose the cloth may be pulled by hand over an inspection table, or better still, a cloth inspection machine may be used. Here the cloth is slowly pulled by suitable mechanism over a sloping table, the drive being under foot-treadle control. An ingenious cloth inspecting table is illustrated in Fig. 56. One side of the reversible table is black and the other side is white, and it is marked by means of a scale to show the width of the cloth being inspected. The cloth may come from a cloth tray, supported on runners as illustrated and be plaited down at the back of the machine, or wound on a roller as desired.

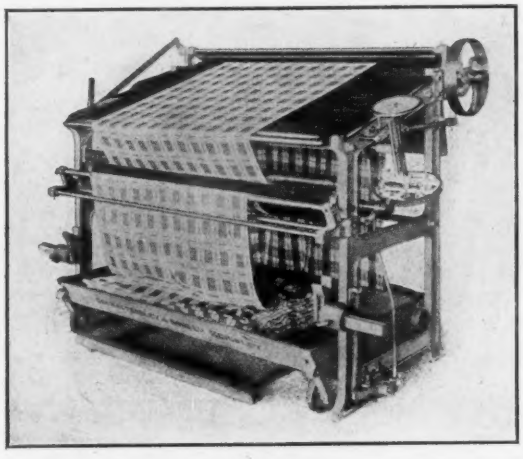


Fig. 56.

A measuring motion is also provided. When the cloth has successfully passed the inspection table, it is ready for the operations of the fustian cutter.

Fustian Cutting.

The operation of fustian cutting is generally carried on as a kindred, but perfectly distinct, branch of the weft-pile fabric industry; it was at one time a cottage industry, but is now mainly carried on under the factory system, and it may be regarded as constituting the characteristic and chief of the various finishing processes to which the loom fabric is subjected. The comparatively long floats of pile filling which form the upper surface of the cloth may be cut to form the pile tufts either by hand apparatus or by machinery. Hand cutting is very extensively practised, and for some purposes is not likely to be easily superseded; it is at present almost invariably used for the highest classes of fabrics, and probably always for long weft pile fabrics such as imitation lambskins and the like. Good lighting of the work-rooms is essential to perfect work, while good eyesight and steady hands are very desirable. The modern tendency towards "high-tension" productive methods in all branches of industry is however, compelling the adoption of mechanical methods wherever possible, and fustian cutting is no exception. Machines are gradually ousting the hand cutter, and may be regarded as having completely superseded hand methods in the cheaper qualities.

In the hand cutting process, the comparatively loose pile filling floats are severed by a special knife formed from square section tool steel of good quality. The knives vary in size from 1-8 inch to 1-4 inch square section, and are from 12 inches to 30 inches long; an illustration of one form of knife is given in Fig. 57. One end of the square bar or rod is forged into an extremely thin keen tempered blade; an elevation of one form of which is shown at B, Fig. 57. The other end tapers to a point and is firmly driven into a wooden haft or handle H. The blade proper is inserted in a specially shaped and pointed guide or sheath S, made from thin sheet iron or steel. The sheath or guide fulfils a triple function—

1. It envelops the blade B on three sides, and gives the blade the stiffness and rigidity necessary to enable it to withstand the stress of cutting.

2. The shape of the tip of the sheath enables it to act as a guide to the blade, and helps to confine the blade to the race being cut.

3. As the knife is pushed forward under the pile filling threads, the sheath raises up this filling from the base of the fabric, tightens it just before it meets the cutting edge, and thus ensures a clean severance of the floats.

The knife and guide are in one piece—they are welded together at the extreme tip; it is obvious that there is little room to spare for any other type of fastening. The tip is shaped and dimensioned to suit the fabric and the pile tuft being produced; it is made more or less pointed according to the length of the float or the width of the race, i. e., to the height of pile being formed. The operator, before starting the cutting, scrapes the surface of the cloth with a blunt knife and brushes it with a hand card in order to loosen the surface and facilitate the cutting.

During the operation of cutting, the knife is laid on the the cloth with the handle fitting into a wooden rest; the latter helps to support the knife at the proper cutting angle while it is in the race. This rest is a low triangular piece of wood of regular thickness, with a rectangular notch cut out of the apex of the triangle in order to accommodate the haft of the knife. When using the "short-run" frame for the cutting of velveteens or corduroys, the rest is placed at or near the back end of the handle when dealing with the former fabrics, and at or near the center of the handle when operating on the latter fabrics.

The board or cutting frame upon which the fabric is laid may be of two kinds; these are termed the "short-run" frame and the "long-dun" frame respectively. Each short-run frame is about two yards long, and several of these are illustrated in Fig. 58, with the velvet cutters at work. Fig. 59, also illustrates a number of short-run frames, while

Fig. 57.

in the center of the room are some long-run frames, each of which is about ten yards long. In the 10-yard or long-run frames, each worker has charge of two tables upon which are stretched two pieces. The operative cuts one race in the cloth on one of the tables as he walks from end to end, then cuts a race in the other cloth on the opposite table as he returns to the position he occupies in the illustration. This alternate cutting of two cloths is solely to obviate an idle traverse or walk of ten yards.*

The cutting knife lifts 50 to 60 picks and tightens them prior to the actual cutting, and in a 24 inch wide velveteen there may be as many as one thousand races. A 2-yard length can be cut by hand in about one hour. The knife must be kept exceedingly keen, and it is necessary to sharpen it about every hour, or after the completion of each two-yard run of cloth. It is stated that modern machines can increase this production about five-fold. Great care is necessary on the part of the operative in "seting-in" the knife into succeeding lengths of cloth in order that no perceptible mark is made.

FIG. 58.

In every frame, the short one of which is the more common, the cloth passes through controlling rollers at each end of the frame; these rollers are gear driven, and may be held in any particular position by a ratchet and pawl arrangement, in order to maintain the cloth at a suitable tension.

It is usual to stretch a length of canvass or other heavy cloth on the frame to form a support for the fabric being cut. Due to the operator bending and reaching over the cloth for the purpose of examining, etc., this supporting cloth tends to become slack of surface at the edge, and fails to support the fustian properly at this point. The result of this is faulty cutting; the knife is inclined to move "toart" or "froart," i. e., to or from the operator and cannot be maintained in its correct position.

The more modern frames are provided with lateral supports which are adjustable in width, and with vertical supports which are adjustable in height, while the frame under the cloth may also be moved laterally—all to provide a more efficient support for the fabric while it is being cut. At one end of the frame is fitted a board or cross-piece termed a "spear" which is somewhat similar in section to S, Fig. 62; the function of the spear is to cause the cloth to dip sharply in a more or less vertical direction; it thus enables the knife to run out of the race in a regular and uniform manner.

The fustian cutter passes the knife through each race in succession in the direction of the length of the faric, and thus cuts all the races from one selvage to the other selvage. When the run is completed, that is, the two yards of cloth on the frame, a new length of cloth is drawn forward on to the frame, and the operation repeated. The fore-going series of operations is repeated until the full length of the piece is cut.

FIG. 59.

In cutting velveteens on "short-run" frames, the cutter stands at the front of the frame looking along the line of the filling, and moves the knife transversely from right to left; in cutting corduroys, it is found more convenient to stand at the end of the frame, looking along the line of the warp, and to move the knife in a forward direction.

In the manufacture of ribbed or hollow-cut velveteens, the cutter passes the knife along vertical races in a pre-determined order, exactly as in cutting ordinary velveteens. The knife is first held vertically, and the floats cut exactly in the middle, when equal-sided tufts are formed. To obtain

*We are indebted to Messrs. Henry Bannerman & Sons, Limited, Manchester, for permission to use the illustrations in Figs. 58 and 59 as well as for information regarding this important finishing operation.

the characteristic rounded formation, certain other races are cut out of the central position in order to form unequal-sided tufts. To cause the knife to cut out of the central position, it has to be held inclined towards or away from the cutter, and from these positions the fustian cutter's terms "toart" and "froart" are derived. As already mentioned, a high degree of manual skill is necessary for the successful production of this type of velveteen.

A study of the foregoing description will show that the weaves employed must secure an equal distribution of the pile stitching points in order that regular courses may be formed for the passage of the fustian knife. If this equal distribution is not secured, the courses are irregular, resulting in light and heavy cuts and an unsatisfactory pile. It is also essential that the sheath or guide S, should fit the race closely, otherwise the point of the guide may easily pick into the floats of the adjoining races, cause the cutting to take place at wrong positions, and produce unequal-sided pile tufts.

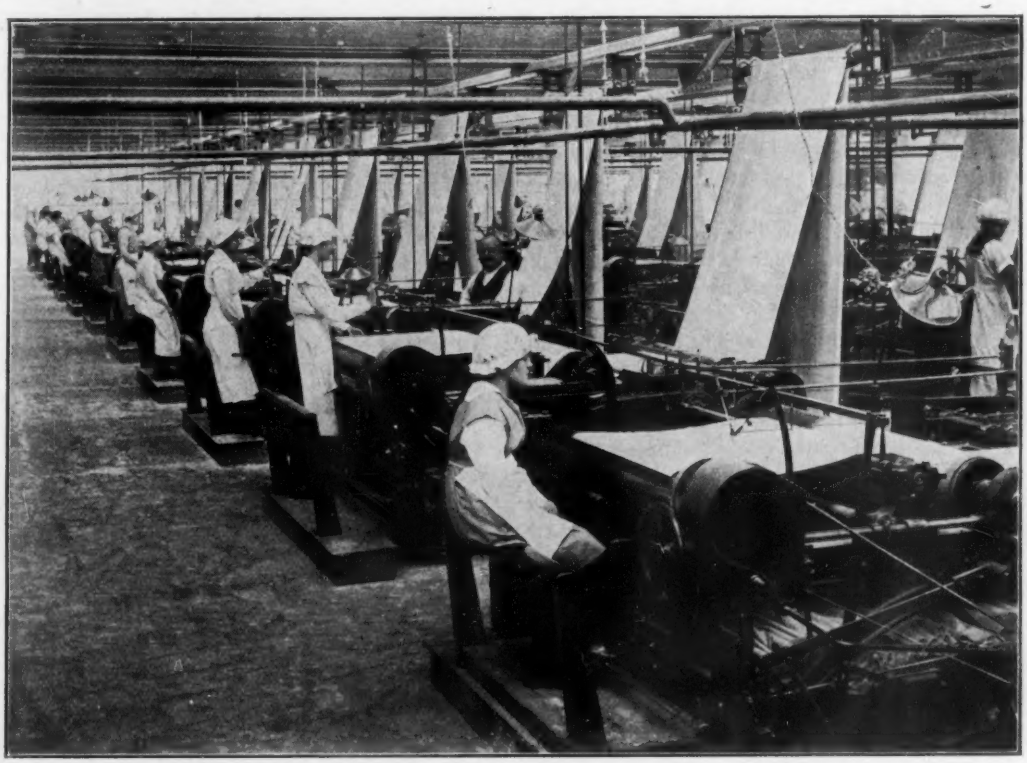


FIG. 60.

It is obvious that such a manual process must be comparatively slow and costly, and many attempts have been made to reduce costs both by improvements in hand cutting apparatus and by the perfection of mechanical methods. In hand cutting, the knife, as shown in Fig. 57, has but one blade, and consequently only one race can be cut at a time. In certain cases, special knives with 2, 3 or more blades have been made, by means of which it is attempted to cut 2, 3 or more races at one passage of the knife. Where this has been done, the blade nearest the haft is straight and in line with the haft; the others are cranked or off-set a small distance, away from the cutter, and each point is from 3 to 6 inches behind the one in front. In other cases, apparatus has been perfected for cutting two cloths at one time; here an extra spear of special form is set in front of, and a little higher than, the ordinary spear, while each cloth has its own set of geared tightening rollers.

Apart from the mechanical means employed, the chief differences between hand and machine cutting are:

1. In hand cutting, the cloth is fixed and the knife moves; in machine cutting the knife has a fixed position—although it may revolve on its own center while the cloth moves.

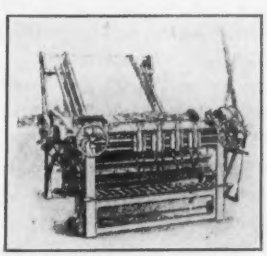


FIG. 61.

2. Hand cutting is an intermittent process, while machine cutting is practically continuous.

Figure 60 is reproduced by permission of The United Velvet Cutters Association, Ltd., Warrington, England, who are noted specialists in the cutting of pile fabrics of all types. The photograph shows a small part of their machine cutting department, and gives a good idea of the style and general arrangement of the machinery used. It will be observed among other things, that the department is airy and well lighted, and that tidiness and cleanliness of person are encouraged amongst the operatives therein employed.

The cloth which is being operated on lies in a lapped or "faked" condition on a long wooden trough extending from the front to the back of the machine; it is clearly seen at the bottom right hand corner of Fig. 60. The cloth passes from this position up to guide rollers which rotate freely in bearings carried by brackets suspended from the roof beams; this allows for a full and free inspection of the fabric before it passes into the taking-in or retaining rollers of the machine proper, and at the same time allows all creases and folds an opportunity for erasing themselves.

From the retaining rollers the cloth passes directly to the drawing-off rollers, and between these two sets of rollers the actual cutting takes place. The apparatus carrying the cutter is clearly seen in position on the machine in the foreground of Fig. 60. The mechanism of the main parts of the machine is comparatively simple, but the machine as a whole is complicated by the necessity for minute and accurate adjustment of the cutter, and by the necessity of providing stop-motions in order to guard against any possibility of injuring the fabric through faulty working of any kind. Those stop-motions may be mechanically or electrically operated; some machines have combinations of both. They are designed to stop the machine individually on the occurrence of any fault such as the knife meeting with an obstruction while cutting, the knife penetrating or piercing the foundation of the fabric, etc. For example, should the cutter pierce the cloth it may be made to complete an electric circuit with the cloth support, and thus bring the stop-mechanism into action. It should be noted that the two ends of the piece are stitched together, so that the cutting operation is practically continuous, save for the small space of time occupied by the attendant in adjusting the cutter to the next race at the end of each run. In addition to the automatic stop-motions, the machine is under the control of the operator's foot.

Machinery is more commonly employed for the cutting of cotton cords than for velveteens due to the heavier and more robust construction of the former, and to the fact that corduroys have a small number of races per inch of width compared with corresponding qualities of velveteens. The fine and accurate adjustments necessary for velveteens are required in a less degree, and hence machinery may be more easily adapted to give first class results in corduroys than is the case with velveteens.

There are two types of machine in general use named after the style of cutter employed. The first is the "straight-knife" machine, usually adapted to cut from one to four races at one operation. Fig. 61 is a reproduction on a small scale of a typical machine of this class, fitted to cut four races at a time. At the beginning of the operation, the knives are set to quarter the piece, and the two ends of the piece are stitched together. At the end of each run, the four cutters are adjusted by hand to the next four races, one in each quarter, and these operations are repeated until the full width and length are cut. This machine is designed to cut all classes of cotton cords; its makers claim that it does so in a more perfect manner than is obtained by manual means and at less than one-third of the wage cost whilst skilled labor is not necessary. The machine, like the velveteen machine already described and illustrated, is provided with automatic stop mechanism, whereby it is stopped immediately on the occurrence of any fault. The auxiliary mechanism tightens the fabric in narrow strips in the path of each cutter and produces a uniform tension in all parts of the fabric whilst it is being cut.

The principle of the second type of machine is illustrated by the diagrammatic sketch in Fig. 62, which illustrates in a more or less graphic manner the cutting parts of a circular knife machine. Several thin, sharp, circular cutters are loosely mounted on a shaft or mandril M, which is driven at a fairly high speed indicated by the arrow X. The cutters are driven by a flat on the shaft and a projection in the bore of the cutter as shown at D. One cutter is provided for each race in the width of the fabric, so that the cutting operation is completed in one run. A crosspiece or spear S, is adjusted close to the edge of the cutter C, at the point P, and over the apex of the spear S, the fabric or texture T, is caused to move in the direction indicated by the arrows Y, and Z. On a level with the upper edge of the spear S, steel guide wires G are fitted, pointing forwards, and at their points, slightly downwards into each of the races. These guide wires G are formed in the shape of an elongated flat loop, as is more clearly shown in the lower or plan view in Fig. 62. The cutter is located inside the loop, and may be moved laterally by the pressure of the

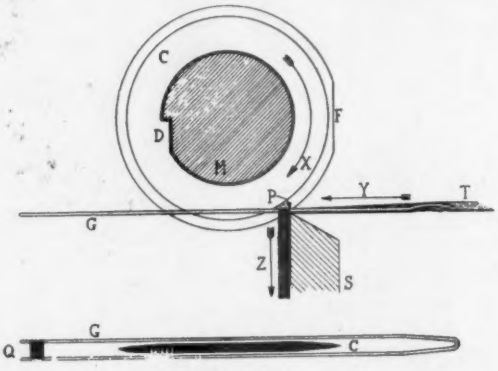


FIG. 62.

threads forming the race, so that the cutter is kept in its correct central position irrespective of any irregularities in the uncut fabric. The guide wires G also perform the function of tightening the pile floats before they are presented to the rapidly revolving cutter. The back ends of the guide wires are soldered together as shown at Q. As the uncut texture T is drawn forward to the cutters C, the guide wires G are carried along with it until the soldered ends Q are brought up against a series of cams mounted on a shaft suitably arranged behind them. These cams or pushers act upon groups of three or more guide wires G, and push them forward into the race again; the cams are arranged spirally around and along the shaft, so that they may come into action at different times.

Each cutter C is formed with a flat upon it is shown at F. The mandril M may be turned until all the flats are opposite the cutting points P; a little greater space is thus formed between the cutters and the edge of the spear S, which facilitates the insertion of the guide wires G into their respective races either at the beginning of the cutting operation, or when guide wires are being repaired or replaced. It will be appreciated that the flat spoils the continuity of the cutting edge but owing to the high speed of the cutters there is no adverse effect on the cutting operation. As a matter of fact in certain types of cutting apparatus for somewhat similar threads interrupted parts are preferred to perfectly circular cutters. It is hardly necessary to state that efficient stop-motions are an essential feature of the machine.

(To Be Continued.)

Sodium Peroxide as a Bleaching Agent

BY WILLIAM B. NANSON.

Sodium dioxide or peroxide, Na_2O_2, is obtained when the metal is burned in an excess of air or oxygen. It is now made on the large scale according to Kastner's process, which consists in placing sodium on aluminum trays loaded onto small wagons, which are then run through an iron tube, provided at each end with tightly closing iron doors, set in a furnace and heated to 300 degrees. A current of dry air, free from carbon dioxide, is passed through the tube, the peroxide produced being withdrawn at one end and fresh charges of sodium being introduced at the other. The technical product thus obtained contains about 90 to 93 per cent of sodium peroxide.

The peroxide as it comes into the market is a yellowish mass, partly powdered. On adding water to a small quantity any particles of metallic sodium present will ignite. Its powerful oxidizing action in the presence of water presents several dangers. Thus, for instance, it may be warmed with aniline or benzene, in the absence of water, but on the addition of water the mixture (if particles of metallic sodium be present) at once takes fire.

It absorbs carbon dioxide with the formation of sodium carbonate and liberation of oxygen, and a mixture of this oxide with potassium peroxide is used in lifesaving apparatus to regenerate air contaminated with respiration. With CO it yields sodium carbonate, and with N_2O and NO sodium nitrite.

Although sodium peroxide is not decomposed when heated alone it readily gives up oxygen to other substances mixed with it, and is, therefore, largely used in the analysis of many refractory minerals, such as pyrite and chromite. As fused sodium peroxide acts most energetically on platinum, iron, etc., it is necessary to use crucibles of nickel as this is less attacked than the other metals.

Sodium peroxide is soluble in water (causing a visible rise in temperature) and possesses a strongly alkaline reaction. When dissolved in dilute mineral acid it yields hydrogen peroxide. Peroxide of sodium cannot, on account of its alkalinity, be employed directly for the bleaching of animal fibers, such as silk or wool. For these it is used as a source of hydrogen or magnesium peroxide. In the latter case a solution of three parts of magnesium sulphate (free from chlorine) and one part of sodium peroxide is used; after treatment with which the goods are treated with dilute acid and washed well with water.

Sodium peroxide dissolves readily in water with the formation of caustic soda and hydrogen peroxide, a portion of the latter simultaneously undergoing decomposition into water and oxygen owing to the heat evolved during the solution.

By exposing the peroxide to moist air free from carbon dioxide, or by the cautious evaporation of its solution in cold water, tabular hexagonal crystals of a hydrate Na_2O_2, $8H_2O$ can be obtained, which on standing over sulphuric acid lose water, forming the dihydrate Na_2O_2, $2H_2O$. The octohydrate is also produced by adding 1½ to 2 times its volume of alcohol to a solution of caustic soda and hydrogen peroxide. The hydrate dissolves in cold water without decomposition, but on heating the solution, oxygen begins to be evolved at 30 to 40 degrees C., the decomposition of the salt being complete at 100 degrees C.

Sodium peroxide is employed as an oxidizing agent, as a source of oxygen in the laboratory, and in the preparation of bleaching solutions containing hydrogen peroxide.

The following method may be used for the analysis of sodium peroxide: About 0.25 grams of the sample is introduced into the dry tube of a nitromiter flask, and about 5 c. c. of water (containing a few milligrams of precipitated cobalt sesquioxide in suspension) are placed in the flask itself.

Rapid and complete decomposition of the sodium peroxide results immediately it is brought into contact with water and the volume of the oxygen evolved is the available oxygen contained in the weight of peroxide taken.

A sample of the commercial substance tested by this method gave in three experiments, 18.54, 18.46, and 18.51 per cent of available oxygen. The same sample contained 78.66 per cent of sodium oxide, and 0.49 per cent of alumina and iron oxide, Therefore the calculated composition was:

Sodium peroxide (Na_2O_2)	90.41 per cent.
Caustic soda (NaOH)	8.73 per cent.
Alumina and oxide of iron.....	0.49 per cent.
Undetermined	0.37 per cent.

This sample contained a very little carbonate, a trace of chloride, a minute trace of sulphate, and a few particles of unoxidized metallic sodium.

It has been shown that sodium peroxide decomposes in contact with water with the formation of sodium hydrate and hydrogen peroxide thus: $Na_2O_2 + 2H_2O = 2NaOH + H_2O_2$, and I would say that with acids a similar reaction takes place thus: $Na_2O_2 + H_2SO_4 = Na_2SO_4 + H_2O_2$ When exposed to moist air it gradually decomposes, the hydrogen peroxide being lost. If it be left in contact with inflammable material, such as cotton or wool, sufficient heat is often developed to cause ignition. On this account sodium peroxide should never be allowed to lie about on a floor, and should be carefully preserved in air tight drums or tins until required. The commercial article contains from 19 to 20 per cent of available oxygen. Its chief impurities are iron oxide, alumina, and occasionally metallic sodium. The latter should be carefully avoided, since it reacts with water, forming hydrogen gas.

If sodium peroxide be added without caution to water considerable heat is evolved, the temperature rising sufficiently to cause the decomposition of the hydrogen peroxide produced. In preparing a bleaching solution, therefore, the peroxide should be added slowly to cold water with constant stirring, the temperature never being allowed to rise above 30 or 40 degrees C. Sodium peroxide powder is very irritating to the mucus membrane, and should be added as carefully as possible to the water to prevent its being scattered or inhaled. The solution thus obtained contains hydrogen peroxide corresponding in amount to the peroxide of sodium used.

The regular evolution of hydrogen peroxide is favored by alkalinity and moderate heat, but to insure the gradual

liberation of the bleaching agent it is necessary to control these factors. If, however, the sodium hydrate formed by the decomposition of the peroxide is allowed to accumulate, it may cause damage to the fabrics and give them a harsh feel when finished. After solution of the peroxide of sodium the alkalinity is generally neutralized with sulphuric acid and a slight excess of acid added. The bath is then brought to a state of faint alkalinity by means of ammonia. Sodium silicate is sometimes used to neutralize the acid, but it is not so good as ammonia. Sodium and ammonia phosphate, with or without ammonia, are also employed in making up the bath and frequently magnesium sulphate (Epsom salts). The latter body is weighed out in the proportion necessary to neutralize the liberated caustic soda, dissolved in a little water, and slowly added to the bath with constant stirring. It reacts with the sodium hydrate, producing sodium sulphate and magnesium hydrate thus: $2NaOH + MgSO_4 = Mg(OH)_2 + Na_2SO_4$.

Magnesium hydrate has no action on animal or vegetable fibers, and the bath can be used just as it is. When magnesium sulphate is used, a bath of sulphuric acid should always be employed afterwards, to dissolve any magnesia adhering to the goods, followed, of course, by a thorough washing with water. It is also necessary to see that the goods are free from soaps, or magnesium soaps will be formed which will protect the fibers of the goods from the action of the peroxide. The peroxide should always be dissolved in a separate vessel and allowed to settle, the clear liquor being drawn off into the bleaching vat. In this way the greater part of the impurities are removed. Thus iron oxide and alumina will have been precipitated as hydrates or phosphates. The clear solution is then heated in the vat to a temperature of about 40 degrees C. and the goods entered.

Where piece goods are being bleached it is advisable to have some mechanical form of dolly or winch with which they can be worked, or to insure continual circulation of the liquor by means of a pump. This is very important, since, in the absence of this precaution, there is insufficient circulation and the weight of the goods often prevents their thorough saturation or the removal of the used liquor, and uneven bleaching results. As a rule the goods should be worked continuously for about three hours, after which they may be left for a further period of twelve hours. The bleaching vat must be provided with a perforated tap, which can be fixed in such a way as will insure that the goods are completely immersed, and the volume of water must, of course, be sufficient to allow of this.

The reaction of the liquor should be tested from time to time and, if necessary, corrected. It is also desirable to test the strength of the liquor with regard to hydrogen peroxide and, if necessary, to strengthen the bath. In the absence of this precaution it sometimes happens that the liquor becomes so weak that bleaching ceases. After being thoroughly saturated with the liquor, goods are sometimes taken out and exposed to the air to complete the bleaching. This, however, must never be done with cotton goods, and the writer does not approve of it under any circumstances.

Sodium peroxide is adapted for bleaching wool (loose wool, yarn or fabric) mixed fabric (half wool and half silk), silk (chappe, bourette, tussah), hair, straw, ivory, etc., a very pure and permanent white being obtained, in contrast to the merely temporary bleach furnished by sulphur dioxide, especially on wool. Owing to its considerably higher price than bleaching powder, sodium peroxide is often thought of less importance in the bleaching of cotton, though it is used for half-woolen goods. With these latter fabrics sulphur bleaching is attended with some difficulties, the cotton being more or less tendered by the sulphurous acid, in consequence of which the addition of alkalis is necessary. These, however, are inadmissable on account of their corrosive action on the wool; whereas sodium peroxide does not injure either kind of fiber, and can therefore be used for bleaching the mixed fabric.

Sodium peroxide is also used for fine cotton goods and laces, and fine cotton or mixed hosiery and underwear.

For fine cotton goods, laces, hosiery, etc., the following bath may be used:

100 gallons water
10¼ pounds sulphuric acid of 168 degrees Tw.
8 pounds sodium peroxide
¼ pound sodium phosphate.

Before introducing the goods, sufficient ammonia is added to produce a slight alkalinity to the bath when tested with litmus paper. The bath is gradually heated to 50 degrees C. when the goods are entered and worked as described.

In addition to the foregoing textiles, sodium peroxide is suitable for bleaching straw, felt, wood, horn, Malacca cane, bones, ivory, bristles, sponges, wax, fats and oils. All the substances to be treated must first be thoroughly cleaned by means of soap or other detergents.

In the case of wool or half wool it should be noted that unless completely freed from fat the material will not bleach. The best detergent in this case is a solution of ammonia, this alkali making the wool bright and preserving its natural softness. Ammonia being volatile, there is no risk of its remaining in the wool after the cleansing process. Potash or potash (potassium carbonate) soap may also be used for cleansing wool, the natural softness of which is retained under this treatment, whereas sodium carbonate makes the fiber hard. An excess of alkali should be avoided especially for fine wool, since it makes the wool yellow, which yellow tinge is a fast color and cannot be afterward eliminated by the sodium peroxide or in fact any other bleaching process.

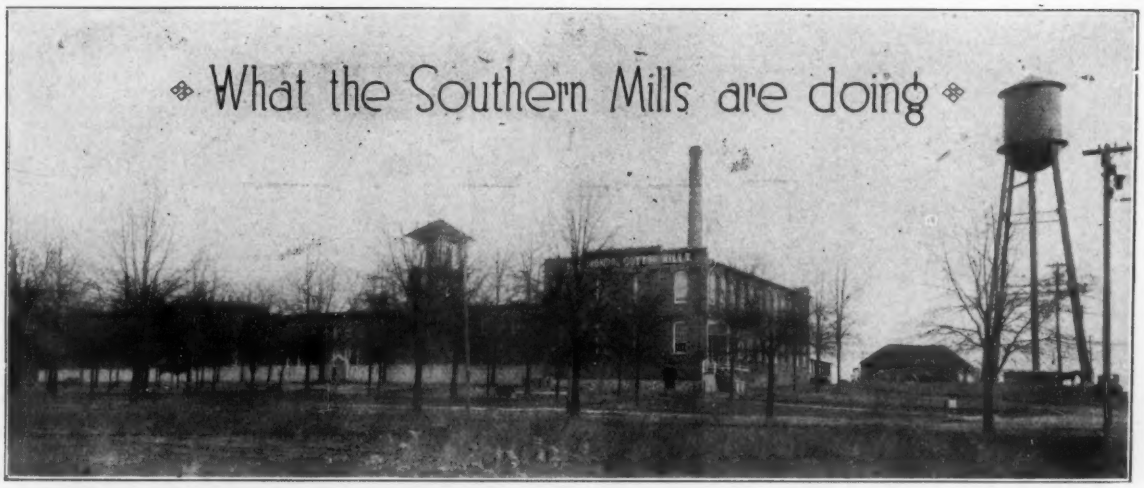
Cotton goods must be thoroughly bottomed, steeped overnight in diastafor, soured, washed, boiled eight hours in a 4 per cent solution of 40 parts soda ash, 55 parts caustic soda, 5 parts soap, washed, soured and washed.

For woolen, worsted or merino yarns or piece goods the use of ½ to 1 per cent of Marseilles soap along with a little ammonia is recommended, while for the second washing the water should contain a little ammonia and about ½ per cent of Turkey red oil.

For carpet yarns or other woolen yarns of very low quality about 1 to 2 per cent of sodium carbonate, with a little soap and about ½ per cent of Turkey red oil seems about right, it being desirable to free these from fatty or greasy matters as cheaply as possible before bleaching.

Since metals and metallic salts exert a catalytic action on the bleaching liquor, and therefore cause the liberation

(*Continued on page* 38.)



MONROE COTTON MILLS, MONROE, GA.

Lane Cotton Mills, New Orleans, La., are adding engine and machine rooms. The addition will be a two-story brick structure 50 feet wide and 100 feet long, giving the mills 10,000 additional feet of floor space. These mills have placed an order for 450 looms to replace existing equipment and to be operated on denims. It is also reported that the Lane mills are planning the installation of considerable dyehouse machinery.

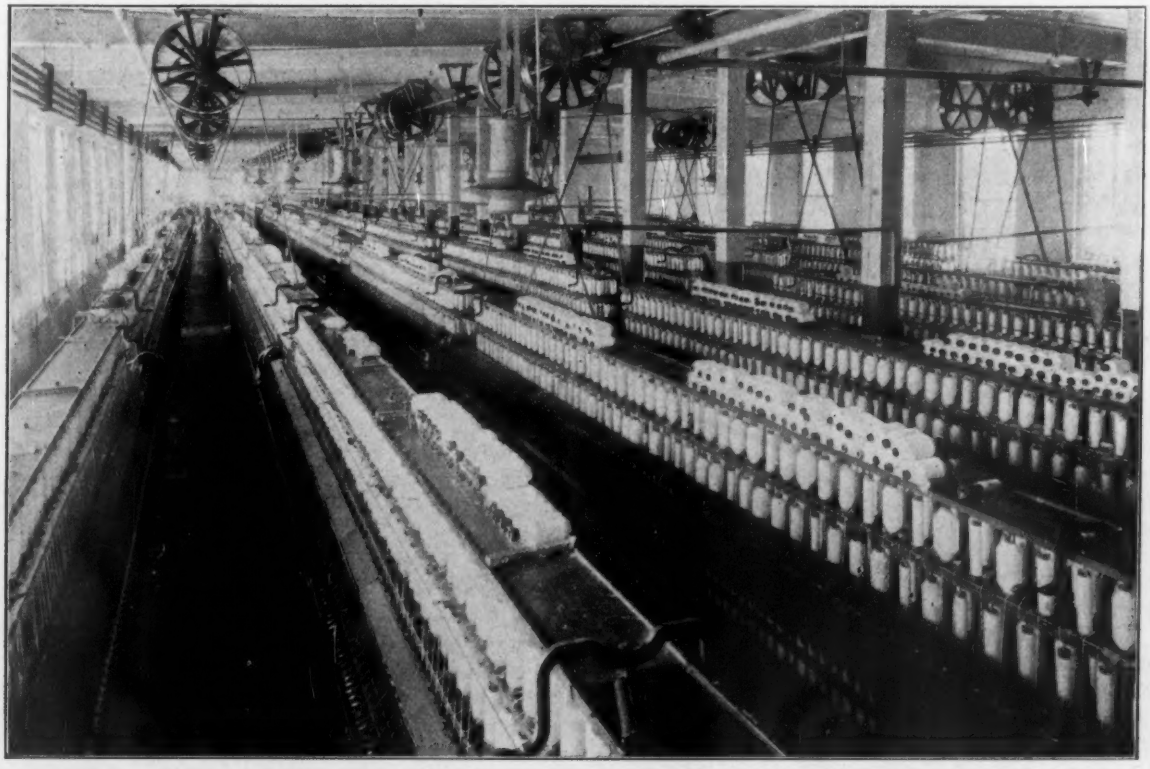
With the third cotton mill for Clover, S. C., now under construction, rumor has it that a fourth mill will be built there. Report is to the effect that this will be built by the same company that is now building the Hampshire Spinning Mill.

The Cowpens (S. C.) Mill has just completed the installation of electric lights in the homes in its mill village, and the houses have all been painted.

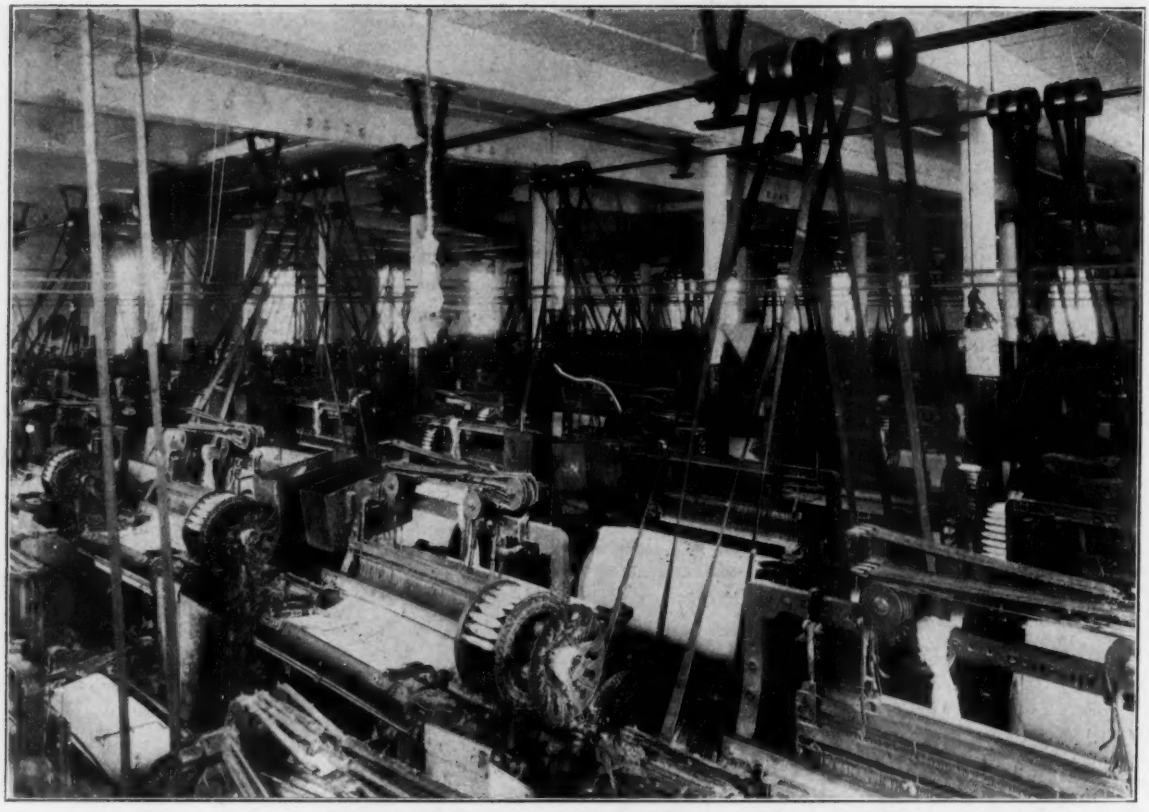
A new Baptist church will be erected in the village of the Nims Mfg. Co., at Mt. Holly, N. C.

Hermitage Cotton Mills, Camden, S. C., are erecting 27 new houses for operatives.

The Williams Cotton Mills, Lincolnton, N. C., have been purchased by a group of local men from the Riddle Company, of Philadephia. The new owners are Capt. C. E. Childs, W. H. Childs, F. S. Childs, Dr. J. R. Gamble and V. M. Ramsaur. Application for charter has been made under the name of Excell Manufacturing Company, and several



LOOKING DOWN THE SPINNING ROOM AT THE MONROE (GA). COTTON MILLS



WEAVE ROOM AT THE MONROE COTTON MILLS.

improvements in the way of machinery will be made immediately.

Thirty-five operatives' houses are being erected in the villages of the Limestone Mill and the Gaffney Mfg. Co., at Gaffney, S. C. It is estimated that the cost of the additional housing facilities will be $65,000.

Lydia Mills, Clinton, S. C., are doing considerable improvement and enlargement work. An addition of 22 new houses to the village has just been completed, and a recent enlargement of the village school building gives three new class rooms and a large auditorium. In the mills a new Foster winder has recently been installed, and the last installment of the 118 new Draper looms have taken the place of the old machines. A considerable amount of street work is being done, and electricians are giving the village wiring and street lighting system a general overhauling.

Eno Cotton Mills, Hillsboro, N. C., have erected 15 new houses in the mill village. This mill also recently compieted a new addition to the manufacturing plant, in which 175 looms were installed, at a cost of approximately $250,000.

An installation of humidifiers will be made at the No. 2 Mill of the Flint Manufacturing Co., Gastonia, N. C., and the plant will also be equipped with sprinklers.

The new McLin Textile Corporation, Rome, Ga., are planning immediate work on the construction of its plant. Julian Cumming is president; Holmes L. Smith, vice-president; and C. E. McLin, treasurer and general manager. William Hardin is secretary. The capital stock has been increased from $100,000 to $125,000.

Lightning started a fire recently in the card room of Mill No. 1 of the Fort Mill (S. C.) Mfg. Co., but the blaze was extinguished without serious loss.

Wateree Mills, Camden, S. C., have let the contract for the electrification of its plant.

The Star Thread Mills, Athens, Ga., will erect a two-story addition to its plant, it is announced. This will be of mill construction, and pickers, warpers, reels, etc., will be installed. Robert & Co., Atlanta, Ga., are engineers.

The Anderson Mills, Lincolnton, N. C., are putting the Hopedale automatic attachment on 100 Whitin looms.

The Southern Manufacturing Co., Granite Falls, N. C., is a newly organized company for the construction of a cotton and cordage mill. This is under the same management as the Falls Manufacturing Co., with D. H. Warlick as secretary-treasurer.

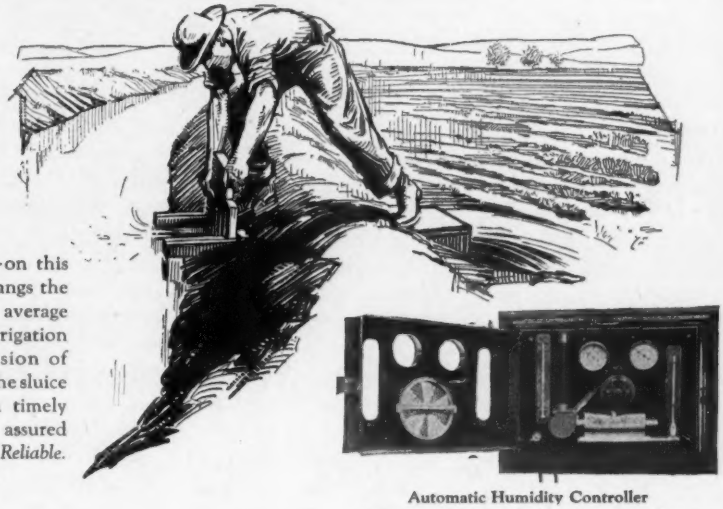
New spinning machinery is being added at the LaFayette. (Ala.) Cotton Mills, recently purchased by the Skenandoah Cotton Co., of Utica, N. Y.

The Lola Manufacturing Co., Stanley, N. C., which now operates 9,176 spindles on 20s to 16s single and ply carded yarns and 16s to 40s combed yarns, and which has plans for installing 5,000 additional spindles, will also equip its plant with 252 looms for the manufacturing of dress ginghams.

The Hannah Pickett Mills, Rockingham, N. C., are building a two-story addition at the rear of the weaving department which will make room for about 300 additional looms, making a total of 1008. The lower story of the new building will be used as an addition to the cloth room.

A one-story addition to the cloth room has been started at the Merrimack Manufacturing Co., Huntsville, Ala. This will be 50 x 130 feet and will be so constructed

Since 1888 reliable humidifying devices.



RAIN from the sky—on this whim of Nature hangs the success or failure of the average farmer. Water from irrigation ditches—by this provision of man's the farmer opens the sluice gates and gets water in timely abundance. His crop is assured because his water supply is *Reliable.*

Automatic Humidity Controller
A device for controlling and regulating Humidifying Systems. Can be applied to systems already installed.

IN a textile mill, to the variability of weather—dry to humid, cold to stifling hot—are added the many other variables of electricity, ventilation and eccentricities of fibers. Unless humidifying devices are reliable the mill superintendent will look at his equipment overhead with constant misgivings, much the same as the farmer gazes at the unreliable clouds. Everything narrows down after all to the Reliability of a device for humidifying a plant. American Moistening Company engineers have held to this primary need—Reliability—in all their inventions from the pioneer years until today. Our ten humidifying devices and systems have proved reliable under all conditions of climate—North and South, inland and on the seaboard.

AMERICAN MOISTENING CO.

Reliable humidifying devices since 1888

Sales Offices: 251 Causeway St., Boston, Mass.

that four more stories can be added. It is announced that the proposed extension work at this place would be postponed until next year.

Manchester Mfg. Co., Manchester, Ga., will erect a community building, containing an auditorium, gymnasium, locker room and shower baths.

Sterling Spinning Mills, Belmont, N. C., have installed cement sidewalks throughout the mill village.

The Musgrove Mills have let contract to W. T. Duncan for the erection of a new school and church building.

It is practically assured that the Kinston (N. C.) Cotton Mills will install looms to manufacture tire cord fabric. They have 17,000 spindles.

The New England Mill Situation.

The New England textile situation is much better than it was a month ago. There are still some wrinkles to be ironed out of the labor and wage situation but production is steadily increasing and the manufacturers speak more hopefully of the future.

The 48-hour week is a bone of contention in several centers outside of Massachusetts, where the 48-hour law is on the statute books. In Rhode Island, some mills in the Blackstone Valley, in the northern part of the state, have conceded the restoration of the 20 per cent reduction, with a 48-hour week. In the southern section, notably in the Knight mills of the Pawtuxet Valley, the 20 per cent wage restoration was conceded, but operatives are working a 54-hour week. In New Hampshire, one small mill in Exeter has granted a 48-hour week. Another, making silk and cotton goods exclusively at Newmarket, has granted a 50-hour week. Silk mills in Paterson, N. J., run 44 hours a week.

The Amoskeag Company has restored the 20 per cent wage reduction but insists upon a 54-hour week. Conferences with operatives, citizens, and the mill management are under way, with the object in view of reconciling the 54-hour week with the Massachusetts mills running 48 hours. As the largest competitors of the Amoskeag are in Maine and Virginia where 54 or more hours are permitted and run weekly, there is little prospect that the Amoskeag management will concede anything like 48 hours. At a meeting of stockholders a statement to that effect was made by the management and it was fully approved.

At the present time about 25 per cent of the machinery in the plant is in operation, and previous to attempts at further conferences in the middle of the month, operatives were returning steadily.

The manner in which public opinion in New England has been marshalled against the mills is a lesson manufacturers are not likely to forget for some time. They were weak in not having agreed fully about their wage policy before attempting to reduce, but it was impossible to bring about an agreement because of the interjection of tariff and political matters into the controversy. Until there is more unity among manufacturers in New England, the section is certain to be a fertile ground for short hour and other disturbing agitation conducted by the labor unions.

As a consequence of the troublesome year manufacturers are taking interest in many changes that must be made to meet the higher costs of production imposed by the higher labor, higher municipal taxation, and continued legislation of a restrictive character that is bound to be seen in thickly settled textile communities. Reasearch work is going on from a new angle. Engineers are working on plans for rearranging production schedules to take advantage of the sub-divisions of time made possible by the larger use of electricity.

One of the recent rumors having a basis of some fact has to do with the probable transfer of some part of the Pacific Mills' bleaching and printing work nearer to their southern mill plants. It is believed that some announcement will be forthcoming soon looking toward a development in South Carolina of bleaching and printing plants. The time and extent of the development is hazy of course, but the Lockwood-Greene engineering interests are thoroughly familiar with the southern field and have close relations with the Pacific. Whatever is decided upon will be in the nature of a permanent establishment, as much more than half the cloth now used in this plant for bleaching occupation comes from the South, and largely from the company's own mills.

It is not yet fully appreciated even in mill circles to what extent mill operations may be sub-divided so that some parts of the plants may be run longer than 48 hours weekly while other parts may be run only to the extent permitted under laws restricting employment of women and children within legal limits. The laws do not restrict the employment of men and work can be so rearranged that men will make more than ordinary textile wages by continued operation. The equipment of textile machinery with electrical motive appliances is only in its infancy. The power in many places is not coming from water but from centrally located coal or oil burning electrical power plants. In Fall River, for example, many mills now buy and use power supplied from the established electrical power plant located on the tide water front.

At the recent meeting of the National Association of Cotton Manufacturers at Atlantic City it was noticed that more attention was given to the research work in the engineering field than ever before. It was pointed out that many mill operations are the result of years of habit and machinery building, rather than as an outcome of original thought given to new invention. All of the work in this direction is being stimulated as the natural result of a determination to maintain the investment in New England and strengthen it from the purely mechanical end. While there is at all times a great deal of talk of certain advantages that arise from proximity to the cotton field and the markets of the world, experienced cotton mill men know that something more than location makes or mars the success of a mill plant.

The markets have been much better in the past month. The improvement has gradually extended over the whole field except that the finishers are only now beginning to get back to better than a three fourths production. The job printing, logwood dyeing, and some other divisions of finishing have not been gaining as rapidly as production of gray cloth.

New Bedford has been selling goods freely this month, not less than 300,000 pieces having been disposed of thus far. The demand has been broader than for a long time. Fancy goods are still on the looms in larger quantities than usual but the development of plain goods demand recently has been noteworthy. Pongees, lawns, organdies, sateens, poplins, plain and fancy cotton and silk goods, and voiles, have been in better call. Stocks have been disposed of and

The Inspector cuts out a narrow strip of the built-up roof from each 25 squares of roof area. These strips are carefully examined and replaced, being reinforced in such a way that the cut does not impair the strength of the roof. The thick top layer of Specification Pitch and the heavy wearing surface of gravel or slag are then applied.

The job is not done until the Inspector's O. K. is on the Barrett Specification Roof—

Not until the finished Barrett Specification Bonded Roof is approved by a Barrett Inspector, is the roofer's contract with the owner completed. For the Surety Company Bond which guarantees the roof against repair and maintenance expense is issued only on the Inspector's O. K.

And not until the Inspector is sure that the roof conforms strictly to The Barrett Specification—not until he is sure that the required number of layers of Specification Felt and Specification Pitch were used, and *properly used*—does he approve the job.

He bases his approval upon his own careful observations while the roof was under construction, and as a final and absolute check on both the materials and the workmanship he makes the famous "cut-out test" just before the wearing surface of gravel or slag is applied. This test is shown and described in the picture above.

The Barrett Inspector takes no chances, for the roof must remain staunch and tight during all the years of the bonded period.

The Barrett Bond Guarantee is therefore even more than a readily enforceable pledge of "no roof repairs." It is proof positive that the roof was properly constructed of the highest grade materials. And after all this is the best insurance of long uninterrupted roof service.

There are two types of Barrett Specification Bonded Roofs—Type "AA", bonded for 20 years, and Type "A", bonded for 10 years. Both are built of the same high-grade materials, the only difference being in the quantity used. Before specifying or closing contract for either of these Bonded Roofs, be sure to read carefully all the stipulations contained in the specifications, copies of which will be sent free on request.

The Barrett Company

New York	Chicago	Philadelphia	Boston	St. Louis	Cleveland
Cincinnati	Pittsburgh	Detroit	New Orleans	Birmingham	Kansas City
Minneapolis	Dallas	Syracuse	Peoria	Atlanta	Duluth
Salt Lake City	Bangor	Washington	Johnstown	Lebanon	Youngstown
Milwaukee	Toledo	Columbus	Richmond	Latrobe	Bethlehem
Elizabeth	Buffalo	Baltimore	Omaha	Houston	Denver
Jacksonville	San Francisco				

THE BARRETT COMPANY, Limited: Montreal Toronto Winnipeg
Vancouver St. John, N. B. Halifax, N. S.

Barrett Specification Roofs *Bonded for 20 and 10 Years*

later contracts are now being placed.

Fall River has been a free seller of goods for four weeks. The stocks of thin odd constructions piled up during the summer have disappeared and prices have risen sharply. Less attention is being given at this center to the staples in wide goods, the output of strictly wide printing cloths being hardly 10 per cent of the capacity. The yardage of odd goods and narrow goods sold has been very large, notably many of the tobacco, hospital, and bag constructions.

The gingham markets have improved greatly. In naming opening prices for spring, the Amoskeag Company did not participate, as it is still uncertain what volume of goods it can deliver. It will probably appear as a factor in the spot gingham market after the turn of the year. In other mills, advances were make varying from ½ to 1 cent a yard for the finer yarn goods. All the leading mills announce that they have sold their possible spring product. It will not be equal to the capacity of the machinery as shortage of labor is still a factor in many textile plants in this section.

Bleached goods have improved but they are still being sold on a very close profit margin. Percales were advanced ¾ cent a yard but have not been sold very freely for delivery beyond January. Prints have sold quite freely for export to South American and other markets. The large corporation printers are fully employed but the smaller job printers are doing barely 60 per cent capacity.

There has been a distinct revival of trade in sheets, pillow cases, and wide sheetings. All the leading New England mills are fully supplied with business and while most of the business was accepted on a close price basis, not related to cotton, the tendency of prices now is sharply upward.

Mills making bedspreads are doing fairly well. They have not been able to sell freely at satisfactory prices, resistance being quite marked in this division, especially in western markets.

In wash fabrics, New England mills have not gone as heavily into ratines as importers or southern manufacturers. Many of the high novelties are being made. A substantial volume of business is on the looms for crepes, voiles, and other sheer grounds, with fancy decorations of many sorts. Mills that can make tissues, swisses, and other sheer yarn dyed specialties are comfortably supplied with orders.

New England cotton manufacturers as a whole are convinced that cotton may become very high when the ginning is completed. Some have already bought freely on every dip in December, the active future month. In fine cottons, the tendency to look to Egyptians is strong since it was determined to remove the embargo and not impose a tariff on this desirable raw material. Complaints are heard of the character of long staple American cotton this year, but this is the buying period and manufacturers may be over-bearish.

There are some merchants in this section who do not expect that cotton goods prices will run to very high levels this winter, despite their view that cotton may be priced high. They say the market will be dominated largely by conditions surrounding consumption. They do not think a full distribution from the current cotton crop can be counted on in cloth markets, if prices are lifted much above the parity of what the farmer can get for his products this winter.

Cotton Comment.

BY H. AND B. BEER.

NEW ORLEANS, OCTOBER 16, 1922.

Never in all of the 50 years of our experience in the cotton business, which dates back to 1872, were we more confident of a rising market than we are today, and seldom have prospects been so favorable for a big rise in values eventually; the present comparatively high prices notwithstanding, which, before the end of the present season will likely look cheap, as there is the probability of cotton cornering itself in consequence of prospects for an inadequate supply to meet indicated world consumptive requirements by at least 2,000,000 bales.

The spreading and multiplication of the Mexican Boll Weevil year by year, moving eastward state by state, now covering almost the entire cotton region from the Rio Grande River where it first appeared in 1892, to the South Atlantic coast in 1922. In 1914 it infested eastward only as far as the western half of Alabama, but it has increased the cost of production by reducing the average yield per acre, which in 1914 was 209 pounds, whereas last year it averaged only 124 pounds, with very little increase this year. Notwithstanding the strenuous and expensive fight made by farmers and government agents to combat the destructive work of the pest, this year's indicated average yield per acre makes a very poor showing, pointing to only 139 pounds, the indicated yield pointing to only 10,135,000 bales from an acreage planted of 34,852,000, whereas from an acreage picked of 36,000,000 acres in 1911, a crop of 16,000,000 bales was obtained, the yield per acre at that time averaging 207 pounds.

Naturally, since a heavy yield per acre reduces the cost of production, it follows that a very light yield per acre, as has been the case the past two years, increases the cost of growing cotton because of the cost in time and money in fighting the weevil with expensive poison. Naturally the farmer must obtain a higher price for his labor, which is reflected in the value of the staple.

But it is said that the present price of cotton, 20 cents basis of middling in the interior, does not compensate the planter; that a higher price, at least 25 cents per pound, is necessary to permit the farmer to make a fair profit. However, due mainly to the recent long period of depression and deflation, many southern farmers were financially involved, were under obligations to meet current debts and found it necessary to sell a large portion of this year's crop to tide them over. By means of having liquidated their indebtedness, cotton producers now are in a position to dictate the price at which they will be willing to sell their unsold cotton in the future, and much of the cotton disposed of already is in stronger hands, being held by speculators, merchants and exporters for a higher price.

Ginning of this year's crop is of record breaking proportions, having been made possible by a long period of exceptionally favorable weather in all sections of the belt, and it is likely that more than two-thirds of the crop has been ginned already, most likely more than 70 per cent as the previous record was last year when 69.9 per

H & B AMERICAN MACHINE CO.

PAWTUCKET, R. I.

COTTON MACHINERY

OUR LATEST ADDITION—THE IMPROVED

CRIGHTON OPENER

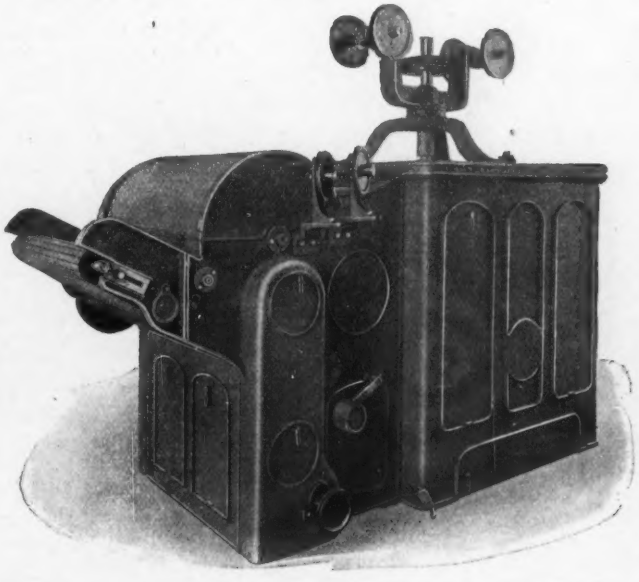
The illustration shows our Latest Improved

Crighton Vertical Opener

with Balanced Rope Drive and Cage Section and Delivery Apron.

The machine contains many valuable improvements, allowing for its adaptability for almost any combination of opening equipment, and many classes of cotton.

This type of Opener has been used successfully for many years in England and on the Continent, and its superior cleaning qualities make it an ideal machine.



Special Bulletin sent on request.

Southern Office:

814-816 ATLANTA TRUST CO. BLDG.

ATLANTA, GA.

cent. of the crop was ginned to October 18th, especially since, based on the indicated crop of 10,135,000 bales, 38.3 per cent was ginned to September 25th, vs. 36.6 per cent last year. Heavy ginnings are apt to be reported to the 18th of October, probably around 7,000,000 bales vs. 5,497,000 one year ago, but they will likely represent about 70 per cent of the year's production, which would leave a smaller percentage of the crop to be ginned after October 18th, than in any previous year. In that case ginnings after November 1st, will probably show a perpendicular falling off.

Therefore, with the probability of war being averted in Europe, the business outlook, especially in the United States, and particularly in the textile line, is exceedingly bright since all important labor troubles have been settled, the supply of coal is increasing rapidly, and with money cheap and in abundance, providing unlimited credit facilities, the buying power of the masses is bound to increase, and will likely be productive of something akin to a boom, which seems to have struck the industrial centers already, especially in some of the textile districts. Spindles are reported to be runnng at full capacity in southern cotton mills, in some instances night and day, and are gradually approaching normal capacity in New England.

WORLD'S CONSUMPTION OF AMERICAN COTTON.

	Last season	Season before last
By northern mills	2,292,000	2,086,000
By southern mills	3,942,000	3,097,000
By foreign mills	6,570,000	5,147,000
By mills of the world	12,804,000	10,330,000

For the first month of this season, American mills consumed during August 588,000 bales vs. 519,000 last year, while consumption during September was 555,000 bales, against 545,000 one year ago, which confirms reports of trade improving and heavy consumption of raw cotton in the United States.

As an index to the future, the following comparatives will suffice to warrant the probability of much higher prices for raw cotton by next summer, perhaps 30 cents or higher before the season draws to a close, if indeed an actual famine is not experienced, in which event there is no telling how high prices may go ultimately:

AMERICAN COTTON.

	This season	Last season
World's carry-over August 1st	4,904,000	9,364,000
Indicated crop, including linters	10,635,000	8,344,000
Indicated world's supply	15,539,000	17,708,000
World's consumption (estimated)	12,500,000	12,804,000
Indicated world's carry-over Aug. 1.	3,039,000	4,904,000
Middling cotton July 31st.	(?)	21.25

While it is possible for the world to consume 13,000,000 bales of American cotton this season, the more conservative estimate of 12,500,000 is used in the foregoing deductions.

Whenever the world's carry-over of American cotton is reduced to less than 5,000,000 bales, which is scattered all over the world and includes domestic and foreign mill stocks, there is a shortage of cotton, even in the south, as was the case the past summer, causing middling to stand at 21.25 cents per pound at the close of July. In 1918 when the world's carry-over of American cotton was reduced to 4,422,-

000 bales on July 31st, and notwithstanding the crop of that year to have been 11,906,000 bales exclusive of linters vs. 10,135,000 this year, the average price of middling that season, 1918-19, was 30.36 cents per pound, and the final price at the close of that season was 34.50.

In view of the probability of the world's carry-over of American cotton at the close of July, 1923, being reduced to about 3,000,000 bales, or about 2,000,000 less than it was this year when middling was quoted at 21.25, and probably more than 1,000,000 bales smaller than it was on August 1st, 1918, when middling was 27.75 and eventually sold at 34.50 at the close of that season, or in July, 1919, we feel that we are justified in predicting a much higher level of values eventually, perhaps sooner than generally expected.

On October 6th, the world's visible supply of all kinds of cotton was as follows:

	This year	Last year
American Cotton	2,395,000	3,963,000
Foreign growths	1,194,000	1,754,000
Totals of all kinds	3,589,000	5,717,000

Akin to the situation in the United States, when the crop promises larger than last year's but is probably insufficient for trade requirements, the present indicated foreign yields are less than normal, as will be seen by the following table:

	This year	Last year	Normal
Egypt	1,070,000	684,000	1,250,000
India	3,300,000	3,735,000	4,500,000
Mexico	115,000	126,000	150,000
All others	2,500,000	2,391,000	2,500,000
Total	6,985,000	6,936,000	8,400,000

Inasmuch as the world's consumption promises to exceed production for the second consecutive year, there is no wonder in finding spinners of the world uneasy as to the seriousness of the world's future supply of raw cotton owing to the damage being inflicted by the pink boll worm in Egypt, by the boll weevil in America and by drouths in Texas.

Next year, in all likelihood, the need for larger cotton crops in all cotton producing countries, especially in the United States, will be more apparent than at any time since the American civil war of 60 years ago, as the world's carry-over of all kinds, particularly of American, will likely be reduced to almost the point of exhaustion, the indicated carry-over of American alone pointing to only about 3,000,000 at the end of next July vs. 4,904,000 at the close of July 1922, and 9,364,000 at the end of July 1921.

Were it not for the European political situation, the price of cotton would be higher today. However this feature of the situation is clearing and serves the spinner, merchant, speculator and conservative investor in good stead by offering the unusual opportunity to buy cotton before the anticipated big advance in prices starts to set in.

Our deductions lead us to believe that American mills, which consumed 6,323,000 bales last season, will need about 6,600,000 bales of this year's short crop, leaving only about 3,400,000 bales for shipment abroad, or only about 50 per cent of foreign requirements since foreign mills last season consumed 6,570,000 bales of the American product.

The chronic kicker generally gets kicked.

Sodium Peroxide as a Bleaching Agent.

(*Continued from page* 30.)

of oxygen to proceed too rapidly, the bleaching liquor should always be prepared in a perfectly clean and well bleached wooden vat, an enameled pan being used when the quantity is small. Where direct steam is used for warming the liquor—as in small plants or trial bleachings—lead or earthenware pipes alone are suitable, cast iron pipes being barred on account of their liability to rust.

At a sufficiently low temperature sodium peroxide dissolves in water containing acids, hydrogen peroxide and the corresponding sodium salts being formed. In most bleaching processes for wool, silk, etc., the sodium peroxide must be dissolved in acidified water, in order to neutralize the caustic soda, which would otherwise tender the fiber. If sulphuric acid be used for this purpose, the neutralization proceeds in accordance with this equation: $2NaOH + H_2SO_4 = Na_2SO_4 + 2H_2O$, the solution then contains sodium sulphate, which has no weakening influence on the fiber. Pure water alone must be used for dissolving peroxide of sodium, and the acid used must also be pure, because in the case of impure water a certain amount of oxygen would be wasted for the oxidation of the impurities.

The water used for making the bleaching liquor should also be as cool as possible, this being a condition essential to the preparation of a solution containing caustic soda and hydrogen peroxide at the same time.

Warm water causes the liberation and consequent waste of the oxygen from the peroxide and a considerable rise in temperature always occurs during the dissolving of the sodium peroxide, and care (and ice if necessary) must be used to keep it down.

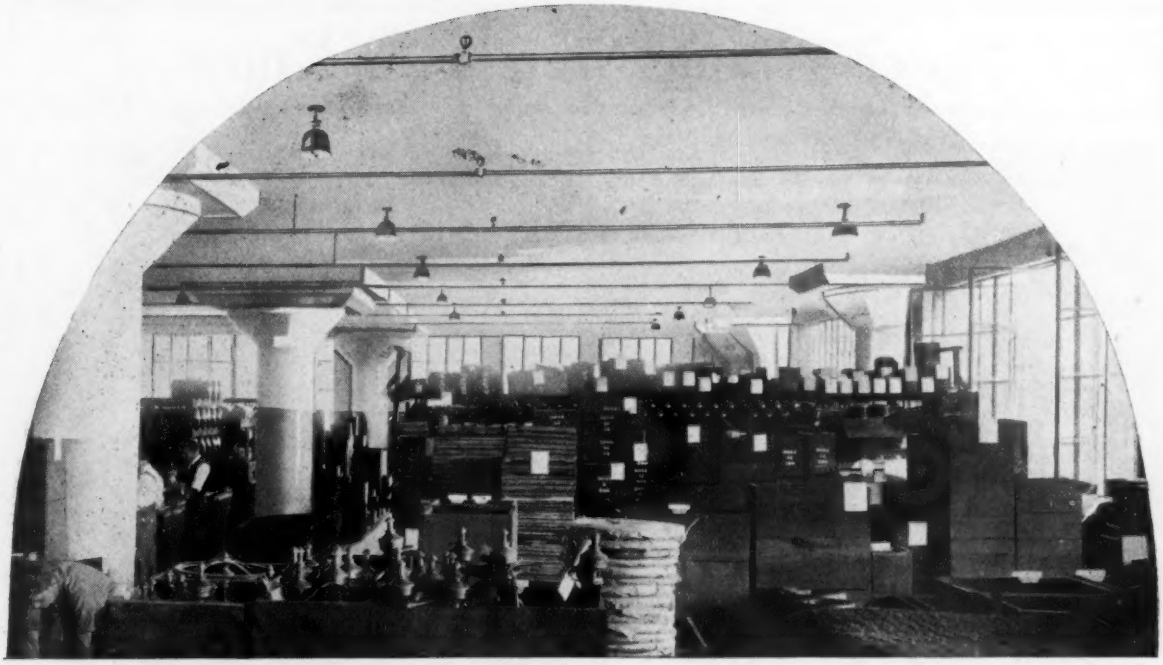
The bleaching liquor is usually prepared by sprinkling the sodium peroxide powder, from a kind of dredger, into the already acidified water, in small quantities at a time, care being taken to keep the water in motion by stirrers and agitators. Among other disadvantages, the addition of larger quantities of peroxide to the water at any one time is attended with considerable waste of oxygen. Sodium peroxide is neither combustible nor liable to spontaneous combustion.

By itself, sodium peroxide cannot be exploded by precussion or shock, or even by the heat of the blowpipe flame, though on account of its powerful oxidizing action on most organic substances it is capable of igniting cotton, wool, straw, etc., especially in the presence of moisture. In adding sodium peroxide to the bath, care must be taken to see that none of the powder is spilled, or, in the case of a bleaching kier, dropped between the false bottom or sides and the lead coil. The powder must be taken out of the drum or tin by means of a clean metal scoop, which must be perfectly dry, to prevent any decomposition of the peroxide. For the same reason the drum, etc., must be tightly closed after any of the powder has been taken out.

Before entering the goods to be bleached the liquor must be tested with litmus paper and if the liquor is neutral or acid it must be rendered alkaline.

The bleaching vat should be of hard white wood or slate, made in such a way that no iron or other metal can come in contact with the bleaching liquor. The only metal

(*Continued on page* 42.)



A Long Term Investment in Daylight

Here are the two questions we want you to ask about Dixielite—**"How much daylight will it coax into my workrooms?"** and **"How long will it last?"** For these are the two prime essentials to consider before purchasing a mill white.

Comparative tests, scientific tests, and long experience in practically every kind of mill, factory and warehouse have proved that Dixielite **attracts** and **reflects** more daylight than any other mill white made.

It causes no glare, but diffuses light evenly to the furthest and darkest corners. For Dixielite is white—not a near white, but a pure, rich white.

And it stays white. Time cannot turn Dixielite yellow nor make it chip, crack or peel. It's washable—soap and water keep it spotless. And figured over a term of years, Dixielite is the cheapest mill white to buy. It is the one perfect white finish for walls and ceilings.

Dixielite comes in flat, semi-gloss and gloss finishes. Eighty years of paint-making experience guarantee its superiority. Write for booklet No. 51 "Keeping in the Spotlight" and any further information you want.

A Word About the Outside.

For the outside of buildings of brick, cement and stucco use Bay State Brick and Cement Coating. It beautifies and waterproofs the surface it covers. The hardest rain cannot beat through a Bay State coated wall. Write for Booklet No. 51.

WADSWORTH, HOWLAND & CO., INC., 139 FEDERAL STREET, BOSTON, MASS.
Branch Stores in the Principal Cities.

Philadelphia Office, 1524 Chestnut Street.
New York Office, 211-219 Forty-Seventh St., Brooklyn.
Southern Office, Greenville, S. C.

DIXIELITE

Notes About Men You Know.

JOSEPH J. BRADLEY, news of whose death on October 26th reaches the editorial rooms just as this number of COTTON is going to press, and who for many years was agent of the Merrimack Manufacturing Co., at Huntsville, Ala.

Good old Joe was one of the best loved men in the southern cotton industry, and his passing will constrict many a throat and cause a multitude of hearts to throb in sympathy for those close associates who will feel the loss the more keenly because of their more intimate daily contact. Through his demise the Merrimack Manufacturing Company loses a competent agent, and the whole cotton industry a valued co-worker.

D. A. JOLLY has resigned as overseer of weaving at the Lanett Cotton Mills, Lanett, Ala., to accept a position in North Carolina.

JOHN W. HARDEN, president of the Neuse Cotton Mills, Raleigh, N. C., died recently, at 53 years of age. Mr. Harden is survived by his widow and four children.

S. T. ENLOE has resigned as overseer of carding at the Lockmore Mills, York, S. C., to accept a similar position with the Hawthorn Spinning Company, Clover, S. C. Mr. Enloe was at York for seven years.

J. W. FERNANDER, JR., formerly of the Griffin (Ga.) Manufacturing Co., has become superintendent of the Lauderdale Mills, Lauderdale, Miss.

NEWT NEAL has resigned as overseer of weaving at the Warioto Cotton Mills, Nashville, Tenn., to accept a similar position with the Buffalo (S. C.) Mill of the Union-Buffalo Company.

M. GOLDSWORTHY has been made superintendent of the Anniston (Ala.) Mfg. Co.

WILL ROWLAND has become overseer of weaving at the Union-Buffalo Mills, Union, S. C., suceeding D. V. Brannon. Mr. Rowland was formerly at the Eureka Mills, Chester, S. C.

COL. HERMAN A. METZ, president of H. A. Metz & Co., Inc., and the Consolidated Color & Chemical Co., and vice-president of the Central Dyestuff & Chemical Co., was nominated for Congress on the Democratic ticket in the 17th Congressional District in the City of New York, in the primaries September 20. Colonel Metz was formerly a representative in Congress from the 10th Congressional District of Brooklyn, and made an enviable record as a member of the lower House. He was also Comptroller of New York City during Mayor McClellan's administration.

JAMES HUSKEY has accepted the position of overseer of weaving at the Cowpens (S. C.) Manufacturing Co.

W. S. HENDERSON, recently resigned as overseer of carding at the American Net and Twine Co., Anniston, Ala., to become assistant superintendent at night at the Columbus (Ga.) Plant of the Bibb Manufacturing Company.

W. B. PITTMAN, who recently resigned as overseer of spinning at the Rhyne-Houser Mills, Cherryville, N. C., has become superintendent of the new Calton Yarn Mills of the same place.

FRANK L. ALLEN, formerly superintendent of the Hochelaga Branch of the Dominion Textile Company, Montreal, Canada, has joined the selling organization of The Stafford Company. Mr. Allen has been with the Dominion Textile Company for ten years, prior to which he was with The Stafford Company's selling division.

ROBERT DELLINGER, of Statesville, N. C., has been made superintendent of the Bowling Green Spinning Mills, Bowling Green, S. C.

B. A. ROBERTS has resigned as assistant superintendent of the Prendergast (Tenn.) Cotton Mills.

W. ARTHUR REID has been made superintendent of the Pelham (Ga.) Branch of the Consolidated Textile Corporation, which recently resumed operations after a year's shutdown. Mr. Reid was formerly superintendent of the Piedmont Cotton Mills, Egan, Ga.

ALONZO F. GUY, superintendent of the F. W. Poe Manufacturing Company, Greenville, S. C., died at the Charlotte Sanitarium recently. Funeral services were held in Augusta, Ga. Mr. Guy had been ill for several months, and had gone to Charlotte for treatment. He was considered one of the most efficient mill superintendents in Greenville. At the time of his death he was fifty years of age. He is survived by his wife.

HARRY W. MOSELEY, who has been cloth room overseer at the Ware Shoals (S. C.) Manufacturing Co., has accepted the position of local manager of the Victor-Monaghan Mills, Greenville, S. C.

M. W. DRIVER, formerly of Yazoo, Miss., was recently made superintendent of the Avondale Mills, at Humbolt, Tenn.

C. W. MCNEALEY, has been appointed superintendent of Echota Mills 1 and 2 at Calhoun and Rome, Ga.

C. G. VOSS has resigned as superintendent of the Buck Creek Cotton Mills, Siluria, Ala.

P. M. MITCHELL has become overseer of weaving at the Eureka Cotton Mill, Chester, S. C.

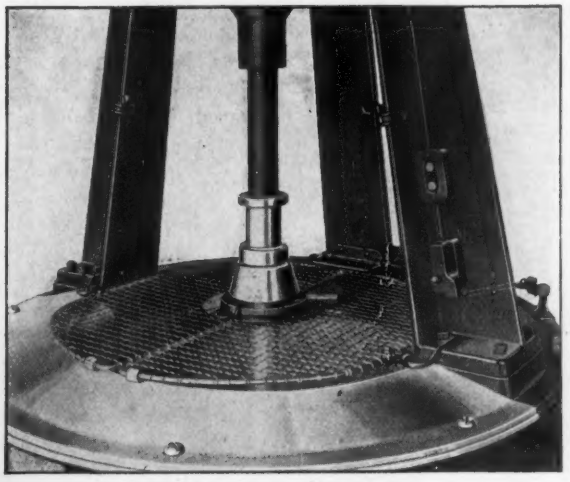
DOSS ELMORE, overseer of carding at the Winget Mills Co., Gastonia, N. C., has resigned and accepted a similar position with the China Grove (N. C.) Cotton Mill. D. S. Crenshaw has been made overseer of spinning at the China Grove Mills.

JAMES B. LAUGHLIN, formerly with the Enoree (S. C.) Cotton Mills, has accepted the position of cloth room overseer at the Beaumont Mfg. Co., Spartanburg, S. C.

A. C. ATKINSON, who has been overseer of finishing at the Sterling Cotton Mills, Franklinton, N. C., has resigned to accept the position of superintendent at the Clayton (N. C.) Cotton Mills.

S. D. BENNETT has resigned as general superintendent of the Efird Mfg. Co., Albermarle, N. C., to accept the superintendency of the new Dixie Spinning Mills, Chattanooga, Tenn. The change will become effective on January 1st.

TOLHURST 48-inch Self-Balancing Direct Motor Driven Extractor



——And NOW Automatic SAFETY GUARDS for Tolhurst Extractors

(Registered U. S. Patent Office)

Two sturdy covers over the top of the basket prevent access by the operator to the revolving basket—protect the operator from carelessness or oversight—and LOWER THE COST OF LIABILITY INSURANCE.

The Extractor cannot be started until the guards are closed.

The Guards cannot be opened until the basket comes to a complete stop.

The Guards prevent access to the basket but permit free access of air and clear view of interior.

The Guards are hinged to swing backward so as not to interfere with loading and unloading of the basket.

Tolhurst Automatic Safety Guards can be obtained at a small additional cost with new Extractors, and are easily attached to those now in use.

A Folder, describing in detail the Tolhurst Automatic Safety Guards, will be mailed free to those requesting it.

TOLHURST MACHINE WORKS, TROY, N. Y.

Established 1852

Sodium Peroxide as a Bleaching Agent.

(*Continued from page* 38.)

which is safe to use is lead, but wood is better. A new vat and all its fittings which are likely to touch the liquor or the goods must be well boiled out with soda ash and washed and then thoroughly soaked with sodium peroxide solution at ½ per cent containing 0.675 per cent of commercial sulphuric acid. Enough of this solution should be used to fill the vat or kier to above the level of the frame which holds the goods down under the liquor, the idea being to remove any impurities and coloring matters present in the new wood. The temperature is raised to 140 degrees F. and allowed to stand over night. Next morning the contents are raised to boiling point; the vat or kier is then run off and washed out well, and it is then ready for permanent use.

The vat or kier is heated by means of a lead steam coil, placed under a false bottom, entering at one end, coiling backwards and forwards, and finally going out at the side or end. An open steam pipe should never be used. The false bottom above the steam pipe prevents the goods from coming in contact with the pipe, and also allows any suspended solid matter to settle out. A movable perforated top is provided, which can be fixed just beneath the surface of the liquor, thus insuring the complete immersion of the goods into the bleaching liquor. For piece goods a suitable dolly or jigger may be used. In practice it is generally found convenient to work with 15 to 20 parts of water to one of goods.

Wool, wool felt, half wool (cotton and wool) fabrics, woolen yarn and woolen plush, can be bleached in the following manner. The goods are first thoroughly cleansed of all impurities by scouring with soap and ammonia or sodium carbonate, and well rinsed with clean water.

To every 100 parts (by weight) of water, which must be free from iron, add 0.675 part of commercial sulphuric acid (66 degrees Baume), stirring this in well, and then sprinkle 0.5 part sodium peroxide in small quantities into the liquid, taking care that the whole of the peroxide is dissolved completely. The resulting liquor has a faintly acid reaction, and must be rendered alkaline to red litmus paper by the addition of pure potassium silicate (or ammonia) before the goods are entered. The temperature of the bleaching liquor should be raised to 122 to 131 degrees F., and maintained at that for from three to five hours by which time the bleaching will be complete. The goods are next thoroughly rinsed, then soured with a little acetic or sulphuric acid and rinsed thoroughly again with clean water.

During the bleaching process the reaction of the bath should be tested at intervals by means of red litmus paper (which should turn blue on immersion in the liquor) and if found to be acid must be rendered alkaline again by a fresh addition of silicate or ammonia.

The bleaching liquor is usually not quite exhausted by one operation, and may be used for bleaching a second or even third batch of goods by carefully adding fresh liquor.

The foregoing bleaching liquor forms a ½ per cent solution of sodium peroxide. For a one per cent solution the quantities of acid and peroxide must be doubled, and so on in proportion for all stronger solutions. In adding the potassium silicate to make the liquor alkaline care must be taken to prevent the undiluted silicate from coming in contact with wool, since it tenders the fiber; and this risk is also incurred when the liquor is too strongly alkaline (ammonia is the safest). In the after treatment of the bleached goods it is advisable to work them in a soap bath, charged with a good textile soap.

Sulphuric acid may be replaced by an equivalent quantity of magnesium sulphate, which must be free of chlorine, the goods being entered into water at 86 degrees F., containing an amount of magnesium equal to 30 per cent that of the goods. After remaining a short time in this liquor the goods are taken out, and 10 per cent of sodium peroxide, calculated on the weight of the goods, is slowly added to the liquor. The goods are then re-entered and left in the bath, at a temperature of 122 to 140 degrees F., for two or three hours, after which they are taken out again, rinsed with water, acidified with sulphuric acid, and then rinsed again, until free from all acid in clean water.

When sodium peroxide is used in conjunction with magnesium sulphate the reaction proceeds in accordance with the following equation. $4MgSO_4 + 4NA_2O_2 + 7H_2O = 4Na_2SO_4 + MgO(OH)_2 3Mg(OH)_2 + 3H_2O_2$.

Sodium sulphate, hydrogen peroxide, and magnesium perhydroxide being formed. The last named compound is particularly important in the case of goods that are difficult to bleach, owing to its comparative stability when heated.

The following are a few types of baths employed in peroxide bleaching:

(1) Sulphuric acid and ammonium phosphate bath:
Water 98 liters.
Sulphuric acid, 16 degrees Baume, 800 grammes.
Ammonium phosphate, 300 grammes.
Sodium peroxide, 350 grammes.

(2) Sulphuric acid bath:
Cold water, 100 liters.
Sulphuric acid of 66 degrees Baume, 1.35 kilos.
Sodium peroxide, 1 kilo.

The whole being made faintly alakaline with ammonia.

(3) Magnesium sulphate bath:
Cold water, 95 liters.
Magnesium sulphate, 3 kilos.
Sodium peroxide, 1 kilo.

To be used as generally described in the body of this article.

Bleaching silk: The amount of sodium peroxide used for silk is 12 per cent instead of 10 per cent, while 30 per cent is used for tussah silk. The liquor is heated to 167 to 194 degrees F. for this material; but in other respects the operation is conducted in the same manner as for wool.

Articles of white silk such as ribbons or silk and cotton mixtures (cotton with silk stripe mixtures, etc.) can be effectually bleached somewhat as follows: All goods must be thoroughly cleansed with lukewarm soap first, and washed in warm water. The bleaching liquor into which they are next entered is prepared by dissolving 200 parts by weight of magnesium sulphate in 18,000 parts of cold distilled water, 56 parts of sodium peroxide being stirred gradually and carefully into the solution and followed by 72 parts sulphuric acid. The liquor should be faintly alkaline, and maintained at a temperature of about 167 degrees F., the goods being left in it for three to four hours and moved about from time to time. After removal from the bath the goods are placed in lukewarm water, acidified with

(*Continued on page* 67.)

AN OLD TIMER SAYS

"I will begin to push a little more for production tomorrow," says the overseer or superintendent as he goes from the mill. "I will look after my supplies a little closer next month," and "I am sure going to fix my machinery up next year."

It is so easy to excuse ourselves from work by putting things off. Some men are always going to do something "tomorrow," "next month" or "next year," and the sad part of it is that tomorrow, next month or next year never gets here. When a man can wake up to the fact that tomorrow, next month and next year *are only extensions of today* he will either quit making excuses and make up his mind to do something, or else give it up as a hopeless case. A lazy man cannot make himself industrious in the future, he must do it *today*.

No man can save money by starting in next year, he must start at once and he must do without things he wants, he must make sacrifices if he expects to save. I do not believe in any man trying to save all he makes, though, and there is where a lot of us fail—we try to do too much, become disgusted and quit.

Now it is just about the same with the way some overseers and superintendents work. They will raise the dickens for one month and then drop off until the crowbar is put under them again. We do not seem to realize that while we are putting off doing the things our conscience tells us we should do, we are spending our future every day. Our future is the most valuable asset we have and we should be very careful how we spend it by constantly putting things off.

When a man gets to be about 40 years old he begins to realize how extravagant he has been with his future, so I want this to be a warning to the reader who is under forty to take stock of himself and advance the spark—give her a little more gas and get up speed for that hill which I am telling you is in the distance. Then when forty, forty-five and fifty comes, you can say with such satisfaction, "Didn't I take that hill on high in fine shape!"

I know you have driven your car when the engine would begin to knock and slow down when you struck a long hill which would cause you to change to a lower gear. Now, apply that to yourself a little while. Are you gradually getting filled up with carbon; do you just run fine as long as you are on a smooth level road with plenty of help, good cotton, all the supplies you want? You know, most any kind of a superintendent or an overseer can run a job when there is nothing going wrong, but the good man shows up when the help have all gone blackberry picking, the cotton is dog-tail and a thousand and one other things happen that are too numerous to mention. Well, you know what you should have done when the "tin lizzie" won't take 'em on high.

Better get busy!

——he works like the mill was built with his own money; he is the first man on the job and the last to leave; he is studying other overseers' and superintendents' methods with a view to applying them to his work where they will fit; he frankly admits that he does not know it all but wants to learn; he does not lose his temper and cuss out the whole bunch at the mill because his wife bought a new hat without telling him beforehand; he never makes a promise to any of his help that he doesn't keep to the letter; he is not prejudiced against the orders his boss gives, but falls right in line and does his level best to carry out the idea just like it had been his own; he never tries to influence the buyer to purchase a certain brand of belting or sizing or starch or any kind of supplies because a certain salesman—well, I won't say the rest of it; but honest, now, I had you fooled a little while, didn't I? Thought I was going to come right out and call your name, didn't you? Suppose you glance back over these few lines and see how much really does fit *you*?

When Benjamin Franklin was struggling to get a foothold in Philadelphia, even when he was eating, sleeping and printing all in one room, he did his work so well that he at once gained the confidence and admiration of his business associates.

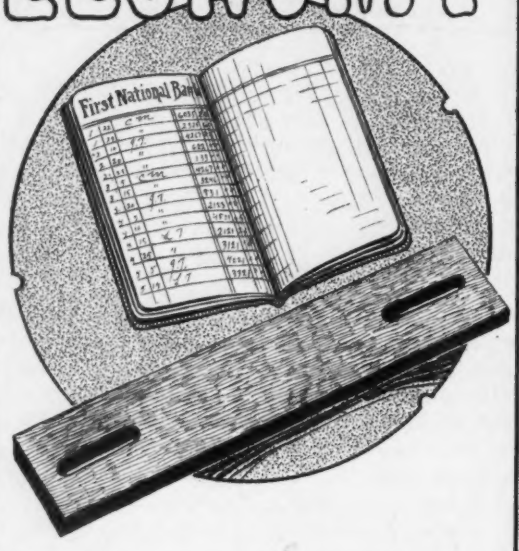
You don't have to have a million dollars, fine clothes and an automobile to win the respect of your associates. But you must W-O-R-K. Work like the dickens and be sure you do your work better than anyone else.

You won't have to write the fact on a placard and hang it on your back for big men to find it out. Don't you, Mr. Overseer, know which is your best section man? Then don't you suppose that the superintendent knows which is his best overseer? The same can apply to the superintendent and his superiors. The man who is not silly will give his brains some exercise and, incidentally, will get his pay raised.

Do you weigh your intermediate picker laps? It won't cost any more to have them weighed just like you weigh your finisher laps. Try it, keep a fair record and tell COTTON'S readers your results.

Laziness and a small salary are like birds of a feather. You know what I mean. Are you?

ECONOMY



OF what does real economy consist? Not the cheapness of an article, but how much that article will save you—how much the use of it will add to your bank account.

The cost of a check strap is small, but the savings effected by Bondaron Check Straps over a period of several years, mean real economy.

QUALITY LEATHER

Bondaron

"The Leather with the Hair On"

Check Straps

in actual use have lasted from two to four times longer than ordinary straps—they have **proved** to be the highest quality, longest wearing and most economical straps ever put on a loom.

The secret of their long life and superior service is the use of specially selected Heavy Swiss Hides tanned by a valuable well-guarded process which produces leather of amazing strength.

Bondaron Check Straps are guaranteed to give you more satisfaction and true economy. Genuine Bondaron Leather has the hair left on. Insist on their use.

Manufactured exclusively by

CHARLES Bond COMPANY

Leather Importers, Curriers and Belt Manufacturers
617-619 Arch St. Philadelphia, Pa.

SALES

Increase the Volume—Reduce the Expense

The purpose of all intelligent sales promotion effort is not only to increase the volume of sales, but to reduce the unit expense of selling.

To these ends, scientific market analysis is vital. It stops guesswork and cuts down mistakes. It shows the opportunities for profit and reveals the causes of loss. It replaces impressions with knowledge; conjectures with reason. It brings to sales management the one basis of correct thought, practical plans and successful action.

Scientific market analysis gives the facts—numerically, graphically, geographically. It covers such essential points as knowledge of the product, statistics of past experience, plant capacity, extent of market, potential buying power, selling plans and advertising expenditure.

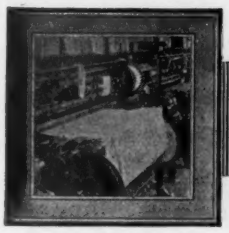
It has been the pleasure of the Ernst & Ernst organization to assist many of its clients, nationwide, in this fundamental work.

ERNST & ERNST

AUDITS — SYSTEMS

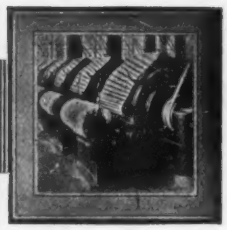
TAX SERVICE

NEW YORK	MINNEAPOLIS	PITTSBURGH	RICHMOND
PHILADELPHIA	ST. PAUL	DETROIT	BALTIMORE
BOSTON	ST. LOUIS	CINCINNATI	NEW ORLEANS
PROVIDENCE	KANSAS CITY	INDIANAPOLIS	DALLAS
WASHINGTON	CLEVELAND	TOLEDO	FORT WORTH
CHICAGO	BUFFALO	ATLANTA	HOUSTON
	DENVER		



How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects



Even Work on Pickers and Cards.

EDITOR COTTON:

It seems there is a lull in the discussion on pickers and the making of even laps. I wonder if the boys have gotten so they can make an even lap, or have given up in despair. I noticed some time ago that several of the writers in COTTON were about to agree that the picker evener was really an unevener rather than an evener. They said that to make an even lap on the finisher, it was necessary to have intermediate laps, so even that evener belt would not have to move except in the case of a lap running out on the apron. They say that the feed roll, evener roll, etc., do not have a constant relation of speed; that sometimes the stock is being stretched, and again it will be bunched up by the movements of the evener.

Doesn't it seem logical, if the evener can take care of a lap running out, it could easily take care of the small variations as they come up? It would be fine to have these very even intermediate laps to run, and all that, but if an evener will not even, then where are we to get these even laps? As a real matter of fact, I do not believe these gentlemen have properly understood the driving arrangement of these rolls as related to the evener.

On all pickers, having a bottom feed roll and top roll that the evener blades rest against, also the apron drive roll are all positively geared together, so that when the speed of the evener changes, the speed of all three rolls change together. The same principle is involved where the evener plates work on top of the roll. Therefore, to my mind, these men's conclusions are all wrong.

The writer contends that if we need an evener to take care of whole laps running out on the apron, an evener properly designed and adjusted will make laps of a uniform weight, yard by yard; there is no logical reason for believing the evener will not do it inch by inch. However, it is a known fact that we do not get laps which are even inch by inch. It has ever been one of the greatest efforts with carders and superintendents to get their laps made with as little variation in total weight as possible. A number of carders will not allow more than one-half pound under or over on a fifty-pound lap. While they will take this same lap to the card, and run it through, making it into sliver weighing on an average of fifty grains to the yard. But instead of having a half-grain or less on either side he will have from three to five grains variation on either side. So why be so particular in the first, and accept such poor results in the second case?

The writer had the pleasure of seeing an indicator running on a finishing picker which had been equipped with apron ball bearings, apron chain drive and put in the very best running condition possible. The purpose of this indicator was to show the variation in the weight of the lap inch by inch. It was placed on the roll running on the back seven-inch calender roll, thus eliminating the chance of stretch at the front. This indicator would show the slightest variation in weight of the lap as it passed between the rolls. This machine was adjusted so that it would make practically the same weight lap, with either three, four or five intermediate laps on the apron. This finisher would run for several hours making forty-pound laps, that would not vary more than one-third pound each way. And yet, this indicator was showing these laps to be varying in weight, in very short lengths, as much as twenty-five to thirty per cent. These extreme variations quite often would occur within a very few inches of each other.

These laps were run on the cards, and while it is the natural tendency of the card to even up the unevenness of the lap, still we found a variation of from forty-four to fifty-three grains in the card sliver.

During the running of these tests on this machine, various changes in settings and speeds were tried out, the only noticeable effect on the thick and thin places being that a strong draft, or a high fan speed, showed up the best in the way of evenness. However, this had a bad effect on the cleaning.

The conclusions drawn from this test were that if a picker evener could so effectively regulate the input of an uneven quantity, that there would be exactly a fixed number of pounds delivered in a given time, and that this quantity was practically regular or even at one yard lengths, there must be something beyond the control of the evener to cause these thick and thin places at such close intervals. The one difficult factor in the whole matter is found in carrying the stock as delivered by the feed roll in a constant flow to its proper place on the screens. Until we can devise some effective way of doing this we will have uneven laps.

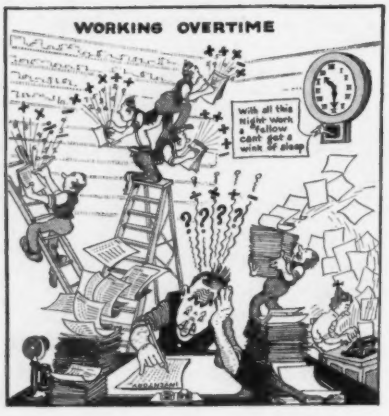
In conclusion, I ask that if any of the readers have already found a remedy, let them pass it along. I feel sure that someone is going to claim that he does not have such uneven conditions as described in this letter, but I hope we will discuss these vital questions frankly. There may be someone, somewhere, who has a picker that is giving entire satisfaction, but that does not change the fact that there is room for great improvement. K. S. (N. C.)

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishng plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

The MONROE

REG. TRADE MARK

Calculating Machine



Takes the *Hard Work* Out of INVENTORY FIGURES

MR. THOMAS OAKES, a well known textile man of Bloomfield, N. J., well remembers what an unwelcome job inventory was, back in the old days of pencil and pad.

But let Mr. Oakes tell you his experience since that time. He says:

"Since we secured our first Monroe, nearly seven years ago, Inventory is a mere incident, a dream instead of a nightmare. We take it twice a year and think nothing of it.

"It used to take two men two or three days of solid, monotonous figuring. But since we have the Monroe it takes two of us ***only three to five hours.*** We can do a former day's work in about an hour and a half.

"In spite of the Speed, there is ***no strain*** because of the constant visible proof. Furthermore it means a saving in the payroll of at least $1000.00 a year.

"Altho Inventory is only twice a year we use the Monroe constantly extending and adding payrolls and doing all other figure-work."

Three Sizes—
a size to fit every business—
20, 16 and 12 place capacities.

The Monroe takes all the hard work out of Inventory figures. Every member of your staff can use it for figuring, adding and checking your inventory values. The Monroe handles with equal ease fractional gross, fractional dozens, fractional yardage, discounts, and all other calculations peculiar to inventory. All fear of decimal errors is eliminated.

The Monroe man will be pleased to loan you a machine **NOW** for the purpose of having your staff become familiar with the many uses to which a Monroe can be put on inventory figuring. Then when the big job of inventory arrives your staff will be able to use the machine to the best advantage. Simply use the coupon.

Monroe Calculating Machine Company

General Offices: Woolworth Building, New York **Plant: Orange, N. J.**

Offices rendering Monroe Service at all Principal Points in the U. S. and Canada

—COUPON FOR YOUR CONVENIENCE—

Monroe Calculating Machine Co., Woolworth Building, New York
Without obligation:
We will accept a loan of a Monroe Calculating Machine at the present time for the purpose of learning what the machine will accomplish on inventory figuring and other work.

Firm Name_____

My Name_____

Address_____

C-11-22

Cloth Defects and Their Classification.

EDITOR COTTON:

In his article on "Classifying Defects in Cotton Cloth," in the September number , "T. T. C." does not seem to me to be consistent in his arguments at all times, especially in his reference to thin places. In his opening sentence he defines a thin place as one where for some cause the filling has given out and the loom has not stopped as it should have done. Later on he refers to a "shuttle mark" as a small thin place. Undoubtedly a shuttle mark may be a small thin place, but could one so classify it if one held strictly to the definition given of a thin place? He concludes his argument on this defect by deciding that thin places may be sufficiently designated and classified by using the terms "small thin places" and "large thin places."

In his treatment of oil, black and yellow, he states that "to aid in locating the possible source of the fault I would most certainly distinguish between oil on the cloth and oil in the warp." Is it not just as essential to locate the cause of thin places?

Consider these cases: On heavy fabrics, such as ducks, stopping the loom with the shed open will cause a thin place. Isn't the weaver the proper person to penalize? If the loom is taking up wrong, taking up an extra tooth once in a while, won't there be thin places? Isn't the proper term here "wrong take up?" If the loom is "banging off," catching the shuttle in the shed, wouldn't the term "shuttle marks" better designate the source of trouble than merely "small thin places?" In these two latter cases, who is to be penalized, the loom fixer or the weaver, if the defect is merely classed as a thin place?

It seems to me that it is just as necessary to designate the source of thin places, large or small, as it is to show the source of oil in the fabrics, and I have yet to see the loom-fixer "who should worry" about shuttle marks because "the old man don't think they hurt." A loom-fixer with that viewpoint needs a short training, a very short training will do, in a duck mill, especially on tire fabrics, and he will soon get converted to the idea that he had better worry, or, better still, get busy, when he is shown shuttle marks in fabric from his section. R. M. (Ohio.)

A Discussion on Fly Frames.

EDITOR COTTON:

I have been a contributor to this department for many years, and I have often stated in many of my articles that the fly frame is imperfect, but that the flyer-lead was the best system. It is my object in this letter to prove that the fly frame is misunderstood by many, and also prove beyond any doubt that all fly frames (regardless of system) are a long way from being perfect.

I assume that the readers are more or less familiar with the cotton roving frame or the fly frame as it is more usually called, and that they are acquainted with its principles and functions.

Therefore, let us first discuss the differential motion and compound.

The object of the differential motion and compound is to give a suitable means for the correct driving of the bobbins, and hold the surface speed of the front roll and bobbin equal during winding. Although there are many types of differential motions, they all have the same object, that is, to give the bobbin two speeds, one equal to the speed of the spindles, the other the additional speed, known as the excess speed. Each builder of course claims his motion to be the best. Some go so far as to claim that their machine is a cone driven frame, or in other words, the bottom cone is no longer a driver, which is an impossibility. The compound or differential motion is nothing more or less than a plain adding machine.

It is not my intention in this article to favor any builder, but instead, to point out that they are all helpless in the making of a perfect winding machine. Let us first consider the Houldsworth motion, which is a compound. The bevel gear fastened to the main or driving shaft by means of the two idlers gives motion to the differential sleeve. Assuming the sun gear as standing, if we give the driving shaft one revolution, the differential sleeve will also make one revolution, the four gears having the same number of teeth, but of course, the sleeve will rotate in the opposite direction to the driving shaft, and the speed of the bobbin is equal to that of the spindle. In order to understand the excess speed or winding of the roving, we must consider the driving shaft as standing still and the sun gear given a complete revolution, which will impart two revolutions to the sleeve. Therefore, this old motion is simply a compound.

The foregoing is nothing new to practical mill men acquainted with fly frames, my only object in repeating this old stuff is to prove that in order to wind the roving on the bobbin, it is necessary to revolve the bottom cone, and thus it must be admitted that the excess speed is driven by a small piece of belting. All builders of fly frames having the Houldsworth motion do not even attempt to deny that the bottom cone drives the excess. However, they do claim that the drive arrangement with the old motion is better than on all so-called differential motions for the reason that a 20 tooth gear drives the sun gear which is often 140 teeth. They also claim that having the spindle and bobbin revolve together is a more simple proposition as regards the cones than a differential or a difference in speed between the spindle and the bobbin.

This is a fact, for the reason that in consequence of that difference in speed, the cones must be of a different form. There is a pointer for ".K S. (N. C.)," who claims that the make of the flyer, presser pad, or even the speed of the frame, have absolutely nothing to do with the outline of the cones in any make of frame. I wonder if "K. S." knows the difference in speed between the sun gear and its substitute?

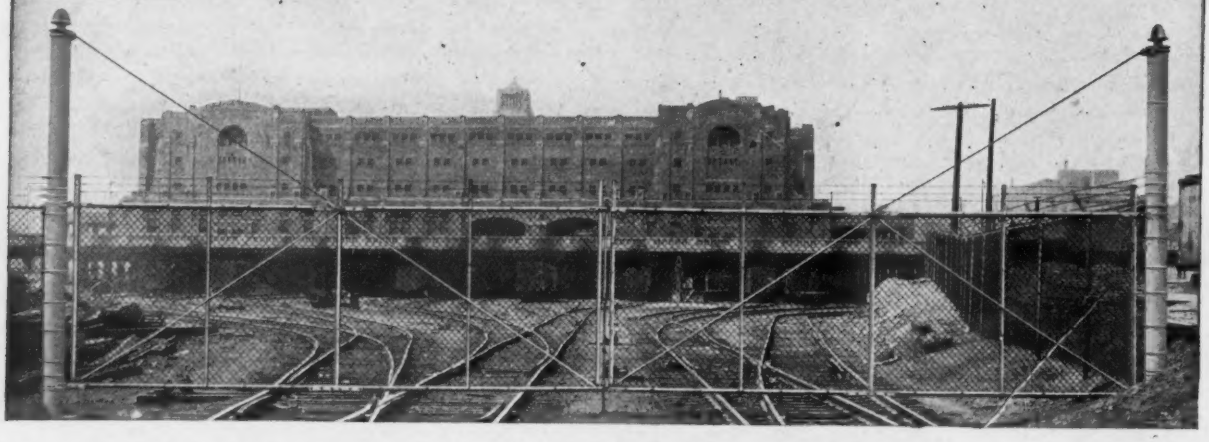
With the old motion we must admit, (1), that the cone belt must drive the bobbin at a speed greater than that of the spindle without any aid from any other source; (2) when the bottom cone is stopped no winding takes place, and the speed of the spindle and the bobbin are equal.

In order to be fair with all builders, I ask the reader to make the following test on any fly frame having the new differential motion: Disconnect the carrier gear meshing with the differential sleeve gear, next, turn the frame and it will be found that the differential sleeve will revolve in the opposite direction to that of the driving shaft. Why? Because the sleeve driving the bobbins gives a greater resistance. Let the reader make the test and watch what takes place. Next, in order to wind the roving the driving shaft must stand still, as in the case of the old motion. Therefore, in order to wind the roving on the bobbin, the

FIRM — BECAUSE THEY ARE ANCHORED

Anchor Post Fences

PERMANENT — BECAUSE THEY ARE GALVANIZED



Over Wide Spans, Under Rough Abuse—These Gates Never Buckle Nor Sag

Photograph shows 40 ft. Railroad Gates and part of line of fencing around yard of Pennsylvania Railroad's new Terminal Warehouse at Chicago.

What protection is a strong fence—unless its gates be strong?

The ordinary gate is often merely an assembled product, depending upon bolts and nuts and *luck* to hold it together. Comes the inevitable force of gravity on heavy members, and it sags. Comes a shock, or an unusual strain, and it buckles. Come the corroding elements, with time, and it rusts away.

We sought in Anchor Post Gates to duplicate the known strength of Anchor Post Fences. We found our answer in *Electric Welding*.

Electric Welding fuses the various members together into one homogeneous section. It makes Anchor Post Gates strongest where other gates are weakest. Hung on posts set deep in concrete, thoroughly hot-dip galvanized against rust,—they are *strong, impregnable*, permanent.

—Just like Anchor Post Fences!

Catalogs, information, estimates—yours for the asking.

ANCHOR POST IRON WORKS

Hudson Terminal Bldg., 50 Church St., New York

Factories: Garwood, N. J. and Cleveland, O.

BRANCH OFFICES

BOSTON, MASS.	79 Milk Street
CHICAGO, ILLINOIS	8 So. Dearborn Street
CINCINNATI, OHIO	141 East Fourth Street
CLEVELAND, OHIO	Guardian Building
DETROIT, MICH.	4th Floor, Penobscot Bldg.
HARTFORD, CONN.	901 Main Street
MINEOLA, L. I., N. Y.	167 Jericho Turnpike
PHILADELPHIA, PA.	Real Estate Trust Bldg.
PITTSBURGH, PA.	Room 404 541 Wood Street
ROCHESTER, N. Y.	1604 Main Street, East

SALES AGENTS

ATLANTA, GA.	Beaullieu & Applewhite 1317 3rd Natl. Bk. Bldg.
BIRMINGHAM, ALA.	2011 Third Avenue C. S. Caldwell
DALLAS, TEXAS	Southern Wire & Iron Co.
GREENVILLE, S. C.	Henry H. Orr 315 Palmetto Building
KANSAS CITY, MO.	The Pierce Co. 930 Wyandotte Street
KNOXVILLE, TENN.	Chas. M. Allen Co. 407 Burwell Building
LOS ANGELES, CAL.	J. E. Dean 616 South Utah Street
MINNEAPOLIS, MINN.	Speare-Jevne Co. Builders Exchange Bldg.
NEW ORLEANS, LA.	J. T. Mann Co., Inc. 308 Tchoupitoulas St.
PORTLAND, OREGON	The Merrill Co. Chamber of Commerce Building
RICHMOND, VA.	R. M. Nolting 119 Mutual Building
SAVANNAH, GA.	Chas. M. MacLean Co. Merchants Natl. Bk. Bldg.
SEATTLE, WASH.	F. T. Crowe & Co. 508 Westlake Ave., North
SAN FRANCISCO, CAL.	Richard Spencer 932 Hearst Building
ST. LOUIS, MO.	Reinforced Concrete Co. 4215 Clayton Avenue

bottom cone must drive the differential sleeve at a speed in excess to that of the driving shaft and with no aid from any other source simply because it revolves faster; thus the work on the cone belt is as great as when the driving shaft is stopped. Think it over. There is no argument.

Some men may say that they fail to see why one motion is called compound and the other differential and yet there is no difference. I have already explained a compound, which adds only. A differential motion is so arranged to drive home the idea that all gears on the driving shaft revolve in the same direction. They do, but the cone belt is the agent that revolves the differential sleeve in the same direction as the driving shaft. The foregoing test can easily be made to prove what I have stated.

The idea of the new differential is, as follows: when the differential sleeve is standing still, the sleeve gear is retarded about a fifth, so that for every five revolutions of the driving shaft the gear driving the bobbins will lose one revolution. So, in order to have this arrangement and drive the spindle and bobbin at an equal speed, the bell gear or gear driving the bobbins must be one-fifth larger.

It takes no expert to reason the fact that if any advantage exists between the old and the new systems, that the old motion is best, owing to the ratio in the gears from the bottom cone to the differential sleeve. Again, with the new motion, in order to wind on the roving, we must turn the bottom cone. On the other hand, if we raise the bottom cone, no matter how fast the driving shaft is made to revolve no winding takes place because the speed of the spindle and the bobbin are equal. Thus we are forced to admit that whether the driving shaft is stopped or revolving at its highest speed, it will do no winding. Therefore, as in case of the old motion, the cone belt must drive the bobbin at a speed in excess of that of the spindle without aid from any other source.

However, one point should be considered here: Is the gearing connections between the bottom cone and the differential sleeve as easy on the cone belt as that of the old motion?

Let's get back to the old motion, and picture in our minds the sun gear being made to revolve in the opposite direction, or in other words, we make the flyer lead the bobbin. Is this the only means that has been developed to date where the cone belt receives aid? In the flyer lead system, the slower the bottom cone revolves the faster the bobbins revolve. All flyers are revolving around the bobbins at a greater speed and this aided by the pressure of the paddles has a tendency to drag the bobbins around, which is a great aid to the cone belt.

The only way that the roving can be strained on the flyer lead frame is by driving the bottom cone at a higher speed, which will reduce the speed of the bobbin.

I hope my point is clear. We all must admit that the fly frame is a long way from being perfect, due to its good working depending on a small piece of belting—the cone belt.

Wash (Mass.)

Pontamine Brown CR is a new direct dyestuff developed by E. I. du Pont de Nemours & Co., Inc., which produces reddish brown shades on cotton, being used principally in combinations for light browns, cordovans, havanas and drabs on cotton piece goods, yarns, etc., although it may be used as a self shade.

To Stop a Speeder from Running Under.

EDITOR COTTON:

Replying to the questions of "Ponco," published in the October number, I will try to give him an idea of a few things that I think would cause his Lowell speeder to run under. First he should see that the skip gear on the end of the dog shaft is in good condition; see that the first tooth is not worn, so that the bevel gear on the end of the top cone shaft will not slip when it meshes with the skip gear. Sometimes a speeder will run for days without any trouble, and then run under or over due to this cause.

He should see that the builder screw is not sprung, causing the builder to bind in closing. He should see that there is no up and down play of the builder screw, and if so, put washers on the builder screw to take up all the play, Sometimes a speeder will run under or over due to not enough taper on the bobbins of roving. He should try a taper gear one tooth smaller, and also see that the square stem of the builder screw is not bent, as this will cause a speeder to run under or over, and is hard to locate sometimes.

Then "Ponco" ought to make certain that the builder jaws or nuts are not rounded over on the ends, and if so, file them on a slant, so that the back part will be lower than the front part. If the builder jaws are rounded over, it will cause the builder motion finger to drag on the builder, causing a delay in changing.

He should be sure that the builder finger motion is not rounded over, if so, he should file it square, so that it will let go of the builder quickly at the end of the traverse

"Ponco" does not state if the speeder runs under when it is half full or nearly full, or if the bobbins all run under, or only a few. Sometimes a speeder will run under when nearly full due to the builder jaws closing by, so that the builder motion finger will let go of the top builder nut instead of the bottom nut as it should. I would see that there is no backlash to the lifter shaft gearing, and that the contact spring is well taken up, so that the skip gear will mesh quickly with the bevel gear on the end of the top cone shaft, when the speeder changes. I would also see that the taper gear does not mesh too deeply with the rack, as this will cause the speeder to change hard, especially if there is a little waste between the teeth of the rack.

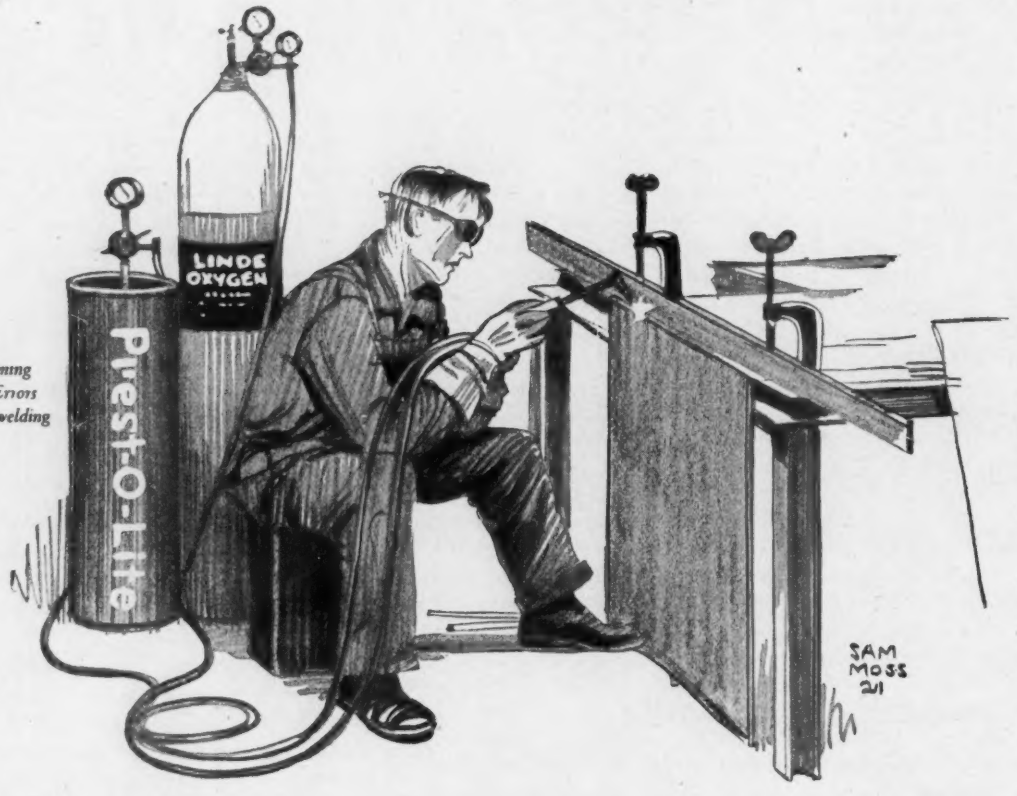
As to "Ponco's" other question—what is a dimity?—all I know about it is that there used to be a cloth made with raised stripes or cords called dimity. But on the whole I know as much about it as the farmer's wife up in Maine knew about what a Presbyterian was. When a hunter inquired of her if there were any Presbyterians around there, she replied, "Dunno, our hired man killed something down back of the barn the other day, but he said it was a woodchuck."

K. C. (Conn.)

EDITOR COTTON:

Following are my answers for "Ponco (R. I.):"

There are three chief causes for any fly frame to run under: (1) a tight tension will cause a frame to run under every little while; (2) dry spindle steps will also cause running under; and (3) enough resistance offered to the carriage making its downward traverse to make the lifting shaft slip slightly.



Reclaiming Shop Errors by Oxwelding

Oxwelding versus Waste

What Oxweld can do for others—Oxweld can do for you.

An illustrated book "Oxweld Can Do It" tells what oxwelding is doing—write for it

Wherever sheet metal is used in manufacture there are bound to be shop errors in cutting so that pieces of incorrect size accumulate.

In almost every case the oxwelding blowpipe can be used to convert this scrap into usable material at a substantial saving.

Thus the usefulness of oxwelding and cutting does not end with production and reclamation but covers the salvaging of misfit materials as well.

Oxweld Service Engineers, stationed in more than fifty important cities, will gladly study your problems and demonstrate how oxwelding can be applied in your business to your profit. There is no charge for this service.

Write for illustrated book "Oxweld Can Do It!"

OXWELD ACETYLENE COMPANY · *Newark, N. J.* · *Chicago* · *San Francisco*

Sales Representatives in the Principal Cities of the World

WORLD'S LARGEST MAKER OF EQUIPMENT FOR OXWELDING AND CUTTING METALS

1323-22

If the traverse is made short by say 1-8 of an inch downward by a tight spindle or bolster, or by other defects if a section of the lifting shaft has slipped, the carriage will make an upward traverse of 1-8 inch longer, which will cause running under. If I was up against it as "Ponco" is, I would go at it in this way:

First, I would see that there was no play in the tumbler shaft, that is, see that the jaw of the dog is not rounded so as to cause the tumbler shaft to rise at the change of one traverse and drop at the next. Rub the face of the builder and dog with emery cloth, to determine if the dog slips slightly before the completion of the traverse.

I would then block the carriage and loosen every coupling. Next, see that all the spindles are the same distance from the roller beam, if not this can be easily remedied on the Lowell frame by the set screws on each side of the spindle rail. Next, tighten all couplings making sure that each lifting gear is in contact with the teeth of each rack.

Then I would remove all blocks and lower the carriage, and measure the distance again between the spindles and roller beam and divide the difference found in the first case if any. Then I would see that the frame is running at a speed for which the cones were modified.

What is a dimity? A dimity is a fine, white cloth made heavy by making the surface rigid or crimped, plain striped or cross-barred. There is also "Dimitos," a Greek cloth, the ends of which are plied and arranged to make a twilled fabric. Wash (Mass.)

What Causes Shedding in Weaving?

EDITOR COTTON:

I have just answered a rather unusual inquiry from an overseer of spinning who said they were having some little trouble with shedding off in the weave room at their mill. Such inquiries usually come from overseers of weaving or superintendents. Thinking probably some of your discussion department readers could give our friend further information, I am sending the letter and my answer herewith for their discussion and comment. My correspondent's question follows:

"We are having a good deal of shedding off in the weaving—not so much, but still it is noticeable—and it just occurred to me to try to find out what was causing it; whether it was in the spinning. So I began to hunt and ask questions, and decided, after considering everything in the spinning, that it was some other place.

"We are running 1-inch cotton, making 29.50s to 30s warp from 5.85 to 5.90 hank roving. I have a spindle speed of 9,075 r. p. m.; front roll speed, 108 r. p. m.; 27.01 turns per inch, with a breaking strength of 51 to 53; with spinners running from 8 to 16 sides. I can't believe that this could be caused in the spinning, with one turn above standard twist and a breaking strength of 51 to 53. Any information you can give me will be greatly appreciated."

I answered my correspondent in this manner:

Naturally, the first thoughts which come to the average mill man with reference to shedding off in weaving are items pertaining to slashing and weaving rather than troubles or defects which would arise in the spinning, although it is possible for some things to be done even as far back as the carding which will have an effect on the amount of shedding in the weave room, provided the sizing and slashing remain the same.

It is possible for the shedding to increase or decrease in a mill when the grades of cotton are changed and when all the other factors in the mill, such as starch, cooking of size, humidity in the different departments and the settings of the loom, remain the same. In other words, anything done in the carding or spinning which will cause the yarn to be fuzzy will of course increase the shedding off in the weave room. Therefore you can realize that this is a very complex subject and it would be impossible for me to give you any definite information unless I had an opportunity of either visiting your mill or having a personal conversation with you.

However, I can make a few suggestions which may lead you into finding the trouble while you are following them out.

First, notice to see if your warp yarn is whipping excessively against the separators, and see that you are getting a reasonable humidity in your room. Then see if the drop wires on the warpers have grooves worn in them. I would suggest using a large pick glass to examine these drop wires. It might be well also to notice the iron rods on the spoolers to see if they have grooves worn in them and if they have, turn the rods over. In other words, look for anything in the spinning, spooling or warping which would cause the yarn to be fuzzy. Fuzzy yarn will of course shed more than yarn with the fibers well laid.

Then I would ask the carder if he has sharpened the beater blades on the pickers recently. It might possibly be that he got them too sharp and they are breaking the fibers. Also ask him if he has changed the setting on the feed plates on his cards; if he has pushed them up closer than a 7 gauge it might be possible that the licker-in is injuring the fibers.

The breaking strength does not indicate that your drawing rolls are damaging the fibers, but it will do no harm to look them over and see if the collars are badly worn.

Then take a trip down to the slasher room and notice the steam pressure on the cylinder. If the yarn is being dried too much the starch will of course be very brittle when it goes to the weave room. Cooking starch may be likened to cooking biscuits. If you ever had to eat cold biscuits when a boy you of course remember that when biscuits were cooked very brown, or in other words cooked "too done," they would break and crumble up very much more than they would when the biscuits were just cooked enough.

Be sure to notice at what temperature the size is kept in the size box at the slasher. If the slasher is not equipped with an automatic control, test the size by inserting a common thermometer, and be sure that it is not less than 185 degrees. Cold size will almost invariably increase shedding in the weave room.

In all of these suggestions, I am taking it for granted that you are using a good grade of starch and that your sizing contains a good binder in the form of some kind of gum, and that you are using a good softener in the sizing.

If the yarn is not very fuzzy and the shedding consists only of starch knocking off, you could possibly help that by increasing the quantity of softener and size you are using to the batch.

A very common fault is size not cooked enough. I strongly advise equipping the cooking kettles with recording thermometers. The charts from these thermometers will

THE EMBARGO DIED HARD

—BUT as a result protection to the American Industry is assured by rates giving more than adequate protection, and the consumer can get what he wants without dictation as to what he shall use.

The following dyestuffs

INDANTHRENE
THIO-INDIGO
HELINDONE
HYDRONE
ALGOL

will be imported by us direct from the manufacturers—

FARBWERKE VORM, MEISTER, LUCIUS & BRÜNING
FARBENFABRIKEN VORM. FRIED. BAYER & CO.
CHEMISCHE FABRIK GRIESHEIM-ELECTRON
BERLIN-ACTIEN GESELLSCHAFT FÜR
ANILIN-FABRIKATION
LEOPOLD CASSELLA & CO.
FARBWERKE-MÜHLHEIM
KALLE & CO.

Dyestuffs manufactured by

CONSOLIDATED COLOR & CHEMICAL CO.
CENTRAL DYESTUFF & CHEMICAL CO.
WILLIAMSBURG CHEMICAL CO.

and other American manufacturers

distributed by

H.A.METZ & CO. *Inc.*
One-Twenty-Two Hudson Street, New York City.
Boston Philadelphia Providence Chicago Charlotte San Francisco

show when the steam is turned on and when it is turned off, which of course gives the exact time of cooking.

The steam line leading to the cooking kettles should have a steam trap located near the kettles to take the condensation out of the line in order to give dry steam for the cooking.

There are many things in the weave room which will cause some shedding off. Anything which will cause the warp to run steady or with the least amount of jerking in the loom will not only help the shedding but will help the warp breakage. I have noticed in many old weave rooms where the gudgeons of the loom beam had worn badly, allowing the loom beam to ride on the let-off gear, with the result that every time the reed hit the fell of the cloth the whole loom beam was jerked.

The setting of the harness and harness cams is another important item. The shed of the harness should be wide enough for the shuttle to pass through without chafing the yarn. If the harness cams are set what a loom fixer usually calls "late," the pick of filling will be dragged over a greater distance of the warp yarn. In other words, if the cams are set with the harness level and the reed four inches from the fell of the cloth there will be more chafing of the warp yarn than if the harness cams are set with the harness level and the reed two inches from the fell of the cloth. Please understand that I am not giving these settings as correct for the style of goods you are making, but merely as an illustration to give you the idea. Changing the settings of the harness cams will oftentimes not only change the appearance of the face of the cloth, but will affect the looks of the selvages; therefore, all of these things must be taken into consideration when setting up the loom.

Contributor No. 74.

(We shall be glad to receive for publication in these columns the comments of any of COTTON'S readers upon the foregoing question and the suggestions made in the answer given.—The Editors.)

Mixing, Opening and Picking.

EDITOR COTTON:

The object of mixing cotton is to secure a uniform grade or, in other words, to make one lot of cotton run as nearly as possible like the preceding one. Cotton as it comes from different plantations and different sections of the country is widely different in character, some of it is cleaner than the rest, some of it is longer in staple, and everyone knows that it is impossible to run a long staple with a short staple and get good results; therefore, it is never used except where it is near enough of the same length to allow it to be run together.

It is impossible to lay down a rule that can be followed by all mills, as some of the older mills and, I am sorry to say, a few of the newer ones, are so handicapped for floor space that it is impossible to mix the cotton so as to get the best results. However, I will describe what I would use in a medium size mill where the floor space is sufficient for the purpose. I would divide my mixing room into two or three parts and then take the bagging and ties off of 10 or 15 bales, being careful to have the correct proportion of each kind of cotton put into the mixing. Then I would take an armful of cotton off Bale No. 1 and spread it over Space No. 1, then get an armful off of the next bale or all the rest of the bales and spread this over Space No. 1 also. When this was done I would repeat the operation until Space No. 1 was filled and then I would repeat the same operation until Space No. 2 and Space No. 3 were full. Each of these spaces should be large enough to hold one day's run. Then by using up Pile No. 1 and as soon as this space is empty filling it up again and proceeding to Pile No. 2 and Pile No. 3, there will always be from two to three days run of cotton opened up ahead. This will give the cotton plenty of time to age and expand and I will say further that if the cotton being used has been compressed, it is necessary that it be opened at least 48 hours before using in order to get the best results.

There are plans for opening cotton which are more up-to-date than the plan I have described, but they require the expense of other machines such as the bale breaker, etc., and as they are seldom used in small or medium sized mills I will not dwell longer on the subject.

In feeding the cotton to the machines it is best to never let the cotton get lower than half-full in the hopper, as this will cause the laps of the first process to be very uneven in weight and thus increase the work of the eveners on the succeeding processes. It is also best to take the cotton from the side of the pile from the top straight down than it is to feed from the top of the pile altogether. This insures getting a part of each layer of each bale. When the cotton leaves the automatic feeder, it is next acted upon by the beater of the opener. The beater of this machine is generally, but not always, of the three-blade rigid type and for cotton of medium length such a beater should be run at about 950 revolutions per minute. I wish to say here that the length of the cotton should largely determine the speed of the beater in all of the machines; the longer the staple the slower should be the speed of the beater, and vice versa. Long staple cotton should be struck from 20 to 40 blows per inch of cotton delivered by the feed rolls. Medium length cotton should be struck from 30 to 50 blows per inch, while short staple cotton may be struck as high as 60 blows per inch. The fewer blows that are struck long staple cotton, consistent with proper cleaning, the better will be the results, as the blows of the beater are apt to break the fibers if struck too often. The beater in this machine (the opener) should be set so as to strike the cotton about 5/16 of an inch from the feed rolls, but in this case also the length of the cotton should largely determine the settings as the beater can be set closer for short staple than for long staple cotton.

After the cotton is acted upon by the beater in the opener it is carried by the air current to the breaker picker sometimes connected by cleaning trunks. There are several types of cleaning trunks in common use and as each of them can be made to do excellent work if properly managed, I will not undertake to describe them except to say that they should be kept clean and all parts of them should be kept air tight except the place where the air is to enter and leave. When the cotton enters the breaker it is acted upon by another beater in much the same way as it is in the opener though in this place the beater is generally of the two-blade type and for this reason it is run at a faster speed than in the opener. For medium length cotton the beater here should be run at about 1,500 r.p.m., but the length of cotton here should determine the speed as in the other case.

EDWARD A. STUHRMAN

Mem. Am. Soc. C. E.
Mem. Am. Concrete Institute.

Candler Annex, Atlanta, Ga.

General Structural Engineering

In

Steel and Reinforced Concrete

Industrial Plant Layouts.

Warehouse—Factories—Commercial Buildings.

Accurate Preliminary Estimates of Cost.

Appraisals. Reports.

The diameter of the beater should also be considered in ascertaining the proper speed of a beater, as a beater of large diameter strikes a more severe blow than one of small diameter and, for that reason, should not be run quite so fast. There may be three things that will cause the throwing out of good cotton at this point. First, if the beater is dull, that is if the edge is worn round, it will throw out three or four times as much good cotton as one with a proper edge. The edge of a beater should be sharp, although it should not have a knife edge on it. This will not only prevent a lot of good cotton from being thrown out, but will insure a lot of the dirt and impurities being taken out. When one edge of a beater gets too dull to do good work it should be turned around so as to present the other edge to the cotton, and when both edges are dull, the beater should be taken out and planed off to give it the proper edge. If the mill is a small one and has no planer, a skillful man can take a file and true it up almost as good as it can be done on a machine, though it requires some skill and a good deal of labor. The file should be held across the blade and pushed lengthwise of the blade with both hands.

The second thing that will cause unnecessary loss of good cotton is improperly set grid bars. If the grid bars are not properly set there will be a lot of good cotton thrown out and a lot of dirt remain in the cotton. There are several different kinds of grid bars in use, but as they all have very much the same principle, I will say only that those nearest the feed rolls should be set about ½ an inch from the beater when at its nearest point, and each succeeding bar should be set a little further away until the last of them is set at least ¾ of an inch from the beater, while at its nearest point the bars nearest the feed rolls should be set about ½ of an inch and this space should be smaller with each bar until the last or bottom bars should have only about ⅜ of an inch between them.

The third cause that will let good cotton be thrown out is for the air current to be too weak. This may be because the speed of the fan is too slow, the belt may be too loose, or the driving pulley too small, and then it may be due to the fact that dirt and foreign matter has been allowed to collect in the flues and thus retard the passage of the air through them. The speed of the fan is all important, as too slow a speed will allow good cotton to be thrown in the waste, while too high a speed will cause a lot of the impurities to be taken back into the cotton after they have been knocked out by the beater.

On medium length cotton, the following machines will generally be found: automatic feeder built to the opener, a breaker picker, intermediate picker and a finisher picker. In mills where long staple cotton is run the intermediate is usually cut out.

The causes of bad and uneven laps are many, but I will mention only a few of the common ones. If the laps are full of thick and thin places it is very likely that the stripping plate is too far from the beater and is allowing some of the cotton to be carried around several times by the beater and then turned loose in lumps. This rail should be set about ¾ of an inch from the beater. Sometimes a fire has caused the solder to melt loose on the cages and allowed them to get full of large holes which will allow the cotton to go by them in lumps. A good remedy for this is to take a small piece of wire and lace up the holes and hammer it down good and smooth. Sometimes a buckle off of a cotton tie will go through and knock a hole in the screen. This can also be fixed as suggested.

The evener motion can also be the cause of quite a lot of trouble. The mechanism should be so set that the belt will play near the middle of the cone or, I may say, never nearer the little end of the cone than the middle, when the machine is running under normal condition with four laps on the apron. This will insure the machine evening up the work if one of the laps should run out before the picker hand could get to it. Another reason why the belt should be kept a little nearer the large end of the cone is that when the belt is shifting so near the small end of the cone it is a great deal more likely to slip, and this will cause a thin place in the lap. The evener motion must be kept well cleaned and oiled at all times, and everything about it well adjusted. The belt should be endless, soft and pliable. All laps from the finisher should be weighed and those that vary over ½ a pound under or over the standard should be put back and run over. If the air current is too much to one side of the machine it will cause one end of the laps to be soft, and a lot of waste will be the result. Too much waste in the mixing will cause the laps to split and I, for one, believe in keeping the waste run up as it is made and not allow it to accumulate, being careful to not get too much into the mixing. There should always be about twice as much air current on the top screen as there is on the bottom one. If a mill is troubled with split laps, I would venture the statement that nine times out of ten the trouble is in the mixing and not at all in the machine.

Bab (N. C.)

Applied Harness Cam Design.

EDITOR COTTON:

Some time ago I wrote for COTTON an article entitled "The Relation of the Treadle to the Harness Cam," and one on "The Relation of the Treadle Roll to the Cam," which appeared in the September and October, 1921, issues respectively. The present article is a step further in the knowledge required to successfully accomplish the drafting of harness cams.

A man may be well equipped as to his knowledge of drafting, designing, or the laying-out of his design, yet

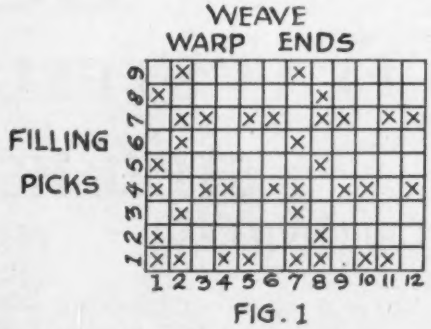


FIG. 1

with all this he may be entirely ignorant of the method of applying the design or pattern of the fabric to the cam. To a man who is to have a thorough knowledge of cams and their action this is an absolute necessity.

The following treatise, if read carefully and closely followed, will show the routine followed in applying the design to the harness cam. First it must be stated that all harness cams are harmonic motion cams. In applying the

1922 Fall Season Card of the Textile Color Card Association

THE NEWPORT COLORS

For Matching Mode Shades

Our highly developed service laboratories are prepared to furnish formulas for the duplication of any of these shades *on your own material.* Every different fabric or material requires a little different treatment or perhaps a different selection of colors and very often the fastness requirements for one line are entirely different than for another. We are prepared to submit formulas to meet your own requirements and our practical mill demonstrators will, on request, assist you in obtaining the results in your own dyehouse.

The use of our service will entail neither expense nor loss of time for you.

NEWPORT
TRADE MARK
"COAL TO DYESTUFF"

NEWPORT CHEMICAL WORKS, Inc.

PASSAIC, N. J.

Branch Sales Offices:

BOSTON, MASS. PHILADELPHIA, PA.
PROVIDENCE, R. I. GREENSBORO, N. C. CHICAGO, ILL.

DRAW-IN only one time and change to any cloth when you weave with

"DUPLEX"

FLAT STEEL LOOM HARNESS

STEEL HEDDLE MFG. CO.

GREENVILLE PHILADELPHIA PROVIDENCE

Southern Office

509 Masonic Temple : : Greenville, S. C.

Hampton Smith, Southern Manager.

N. B.—We are the sole manufacturers of Nickel-Plated Drop Wires for every kind of loom.

design, the first thing to be done is to obtain a copy of the weave which is to be applied to the cam. If this is not at hand it must be obtained from the designer, or determined by analysis. In this instance, for the purpose of illustration, we shall use the weave shown in Figure 1, which, it will be seen, is made up of 12 ends and 9 picks.

Before going further, however, a few facts which are very essential will be here noted, proceeding in the order of their importance. First, it must be firmly impressed on the reader's mind that it is not the number of ends in the

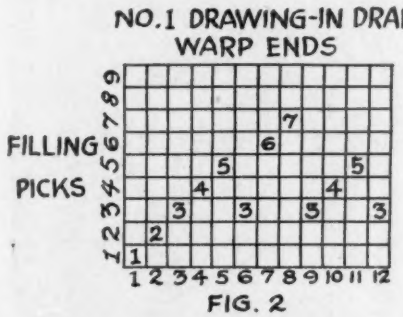


FIG. 2

weave that determine the number of cams per set, but the number of ends which interlace *in a different manner;* any end which interlaces in a like manner to another end may be run on the same cam. It will be noted that the words "may be run on the same cam" have been used, for the reason that in the interest of good weaving, as well as avoiding the possibility of errors on the weaver's part, a slightly varied method is sometimes followed.

Next, in order to illustrate this, a drawing-in draft, Figure 2, has been inserted, which has been made in the regular manner, that is, *every end which interlaces like*

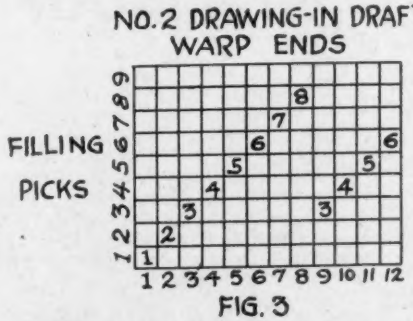


FIG. 3

another end is put on the same harness, after which another drawing-in draft, Figure 3, is shown, which has been varied for reasons previously stated. It will be observed that this pattern could have been woven on seven cams, but that eight have been used, the advantage of this to the weaver being clearly apparent.

Keep in mind this fact also: that the number of picks per pattern has no bearing whatever on the number of cams per set, but indicates instead the number of movements per cam. Each cam operates one harness; therefore it will be clear that there will be the same number of cams that there are harnesses.

We may now state clearly then, that the weave is responsible for the drawing-in draft, while the drawing-in draft is responsible for the cam draft. Having made this clear we may now say that it is not the weave which directly indicates the cams per pattern, but rather the cam draft, which we shall here show. In order that this may be clear to the reader, a lay-out plan of the cam movements will be here given which have been made from the cam draft here shown. (See Figure 4.)

Lay-Out Plan.

No. 1 Cam	2	2	1					No. 2 Cam	1	1	2	1			
		1	2	1						1	2	1			
			1	1							1	1			
No. 3 Cam	3	2	2					No. 4 Cam	2	5					
		1	1						1	1					
No. 5 Cam	5	2						No. 6 Cam	3	2	2				
	1	2	1	1					2	1	2				
No. 7 Cam	1	1	2					No. 8 Cam	2	1	1				

Before leaving this feature of the situation, there are two other points which should be brought to the reader's

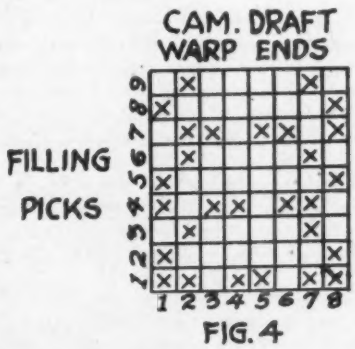


FIG. 4

notice. First, that in making a lay-out plan, he must commence at No. 1 pick and follow No. 1 warp end to its completion or to the last pick in order to determine its movements. Second, that in designing cams he must have constantly in mind the type of harness motion which is to be used on the weave in question, because where the order of movements are irregular as they are in the present cam draft, the only type of harness motion which can be used is one where the action of each harness is independent of another harness, say, for instance, an action much like the Dwight spring head such as is used on the weaving of light goods on the Draper loom; however, the roll motion, either the old roll top type or the Lacey type motion may be used on any weave, where the movements of each harness are equal, for instance on weaves such as the $\frac{1}{4}$, $\frac{1}{1\ 3}$, $\frac{1}{2\ 2}$, $\frac{1}{3\ 1}$, $\frac{1}{4}$, or any other similar weave.

We next come to the division of the circle which is described by the cams in their rotational movement, the number of divisions being determined by the number of picks per pattern, thus we see that it is the picks per pattern which determine the number of divisions in the circle and not, as is generally supposed, the number of cams or harnesses per set.

As the number of degrees in a circle are 360, and the picks per pattern are 9, then $360 \div 9 = 40$ degrees for each pick or 9 divisions of 40 degrees each. Next in order

Cleans Quills Better and at Less Cost.

Mills using Utsman Quill Cleaning Machines employ from four to twelve less laborers than they formerly required for cleaning quills. With a daily capacity of about 40,000 feeler bobbins for the Single-End Utsman and 80,000 feeler bobbins for the Double-End Utsman, the quills are cleaned more quickly, more thoroughly and with less damage to the quills, themselves.

Utsman Quill Cleaning Machines are easy to operate and simple in construction. Even after years of service, they can be kept in perfect condition by anyone with slight mechanical ability.

Heat treated steel parts are used wherever practicable. Castings are highest grade. Workmanship is minutely accurate to insure easy and perfect interchangeability of parts. Utsman machines can be installed with entire assurance that they will give satisfactory, continuous service year after year without interruption or costly breakdowns or repairs.

Five years of cost-cutting service in mills in the United States and Canada have proved Utsman Quill Cleaning Machines to do exactly what is claimed for them. All mills using Utsman machines have substantially reduced their cost of quill cleaning.

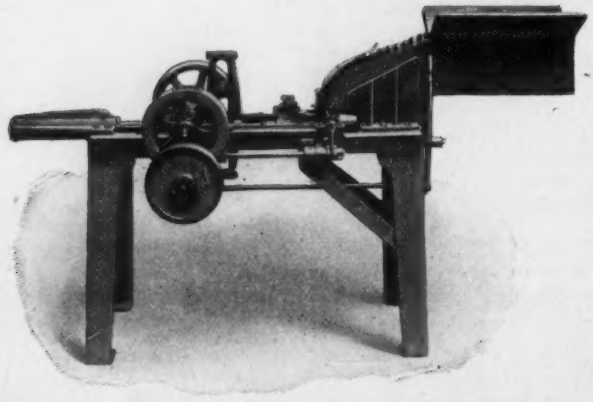
Our Engineering Department will gladly figure for you the cost of an Utsman installation and the saving such an installation will effect for your mill. Consultation in no way obligates you. Have your secretary write us *today* to send you complete particulars.

Every machine trade-marked "TERMACO" is sold under a binding guarantee as to workmanship, material and operation.

THE TERRELL MACHINE COMPANY, INCORPORATED

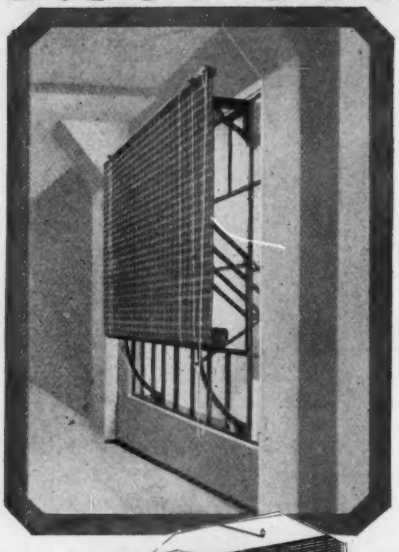
Engineering Dept. **Charlotte, N. C.**

General Supply Co., Danielson, Conn., N. Y. & N. E. Representative.



Single-End UTSMAN bobbin cleaning machine. Either equipped for clutch as shown, or motor drive. About 40,000 feeler bobbins, daily capacity.

RA-TOX



Common Sense Shades Give More Light and Air

RA-TOX Shades for factories, schools, hospitals and other institutions are common sense shades.

They accomplish what engineers have long sought in factory shades.

Thirty per cent more light and air! It's worth thinking about.

Notice the method of hanging. It carries the shade around center swing ventilators; brings shade in close to the wall at the bottom.

Ra-Tox Shades Are Well Made

With ordinary care they will last 25 years. They are constructed of permanently stained wood strips woven parallel with hard twist seine twine.

Ra-Tox fixtures are strong and are attached permanently to the ribs of the steel sash. No expensive boring or drilling of concrete; no jarring loose through building vibrations.

And Ra-Tox Shades cost no more than ordinary shades. They merit, and are receiving the attention of factory and institutional buyers everywhere.

What are your window specifications? Write for price quotations and descriptive literature

Hough Shade Corporation

Industrial Shade Division

300 Mills Street **Janesville, Wis.**

is the manner of applying the order of movements to the cam, and in order that this may be clear a circle is here shown divided into 9 divisions. (See Figure 5.) The points marked 1, 2, 3, 4, 5, 6, 7, 8 and 9 being the point at which movement ceases, or to put these words into practical form, the point which we may call 1 up or 1 down as the case may be. The next point to be clearly impressed on the mind is that a movement of 1 up consists of a cam curve from the outer to the inner diameter, while a move-

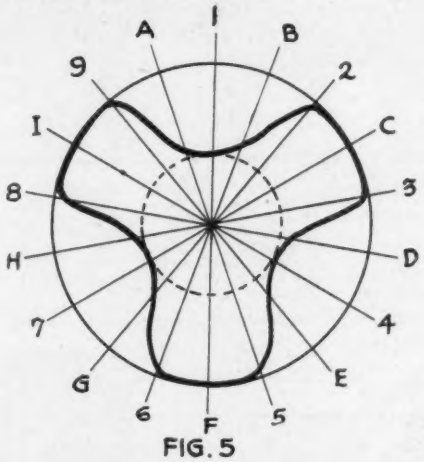


FIG. 5

ment of 1 down consists of a cam curve from the inner to the outer diameter, but if we have a movement of 2 up we should have one cam curve from the outer to the inner diameter, followed by a dwell on the inner diameter. This will be fully explained by reference to Figure 5, and Figure 6, which are of cams composed of $\frac{1\ 1\ 1}{2\ 2\ 2}$ and $\frac{2\ 2\ 2}{1\ 1\ 1}$.

It must also be kept firmly in mind that when a change is being made, there are at least two treadles at work, one

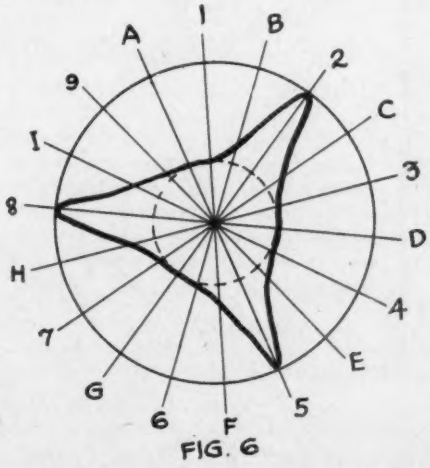


FIG. 6

being depressed while the other is being raised; thus, if it takes a full division to make a change from an up to a down, the two treadles must pass each other midway of the division or at the points marked A, B, C, etc. Thus, if an up was indicated on the cam at 1 then the down curve would commence at 9 and cease at 1, then commence at 1 again and cease at 2. Considering then that the crossing point is midway of the curve or division, then the full space occupied by 1 up is really from A to B.

A term which is used extensively in connection with harness cams is "dwell," meaning that part of the revolution of a cam which performs no work or which is either a part of the outside or inside diameter of the cam. If the cam is not imparting motion to the treadle, or, in other words, if the treadle is not on the cam curve, it must be dwelling on either the inside or the outside diameter. This can be made clear by referring to Figure 7 and Figure 8.

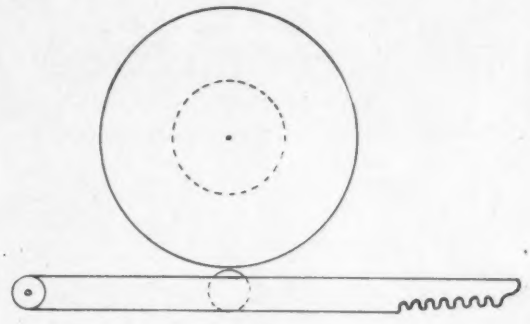


FIG. 7

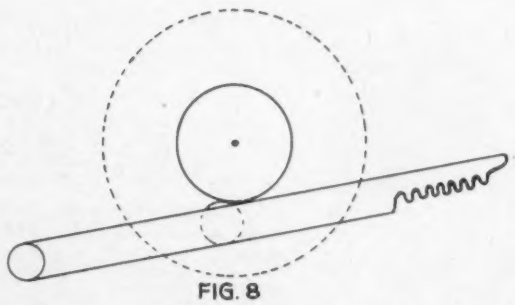


FIG. 8

which show the treadle dwelling on the inside and outside respectively. This may be more clearly illustrated in its relation to the cam by reference to Figure 9 which is the No. 1 cam from the cam draft, Figure 4. Reading the pattern from the cam, proceed as follows: A to C, 2 up; C to D, 1 down; D to F, 2 up; F to H, 2 down; H to I, 1 up; I to A, 1 down. The periods of dwell on this cam are as follows: 1 to 2, a dwell of 1 division on the inside diameter; 4 to 5, a dwell of 1 division on the inside diameter; 6 to 7, a dwell of 1 division on the outside diameter. It will be noted that 2 to 3, 3 to 4, 5 to 6, 7 to 8, 8 to 9 and 9 to 1 consist of either an up or a down curve and therefore during these portions of a revolution there is no dwell.

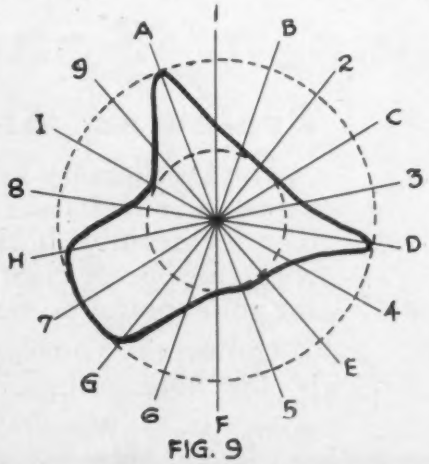


FIG. 9

Benjamin (Conn.)

The Fog
That Hangs Over Dye House Efficiency

VAPOR and condensation is the cause of more damage and inefficiency in the dye-house than any other one thing. The fog is not only detrimental to the health and efficiency of the men, but the continual dropping of condensation, which contains a great deal of objectionable acids, has a disastrous effect on machinery, products, and building interior.

Many mills have considered this a necessary evil, or have thought that equipment to eliminate this evil properly would cost more than it was worth. You can now secure the equipment that is operating so successfully in many mills, together with the engineering service which helped to make the equipment so efficient, and at a cost which is not exorbitant. Such equipment is proving a profitable investment in other mills—why not in yours?

The system is scientific and complete. Our engineer handles the job complete, determines the average vapor, average outdoor temperature, increase in temperature required to prevent vapor condensing, cooling required, and the equipment is installed quickly with no interruption to operation

We also make drying systems for tenter frame drying through hot air drawn over coils. All our systems use the famous Buckeye Blowers or Multiblade Fans—built for hard service.

Catalog and full information sent upon request.

BUCKEYE BLOWER CO., COLUMBUS, OHIO

372 Whitehall St., Atlanta, Ga.
324 Monadnock Bldg., Chicago, Ill.
501 Wabash Bldg., Pittsburgh, Pa.
1400 Broadway, New York, N. Y.

BUCKEYE

SYSTEM for DYE HOUSES

Warren Soaps

Preferred Stock

The best quality tallow, palm, and red oils and olive foots, carefully balanced with the purest chemicals for your special purpose.

Uniformity guaranteed by test before shipment.

Warren Soap Warren Service

Warren Soap Mfg. Co.

Established 1870

77 Summer St., Boston, Mass.

Incorporated 1890

GARLAND

A Fine Looking Loom Harness of Great Durability

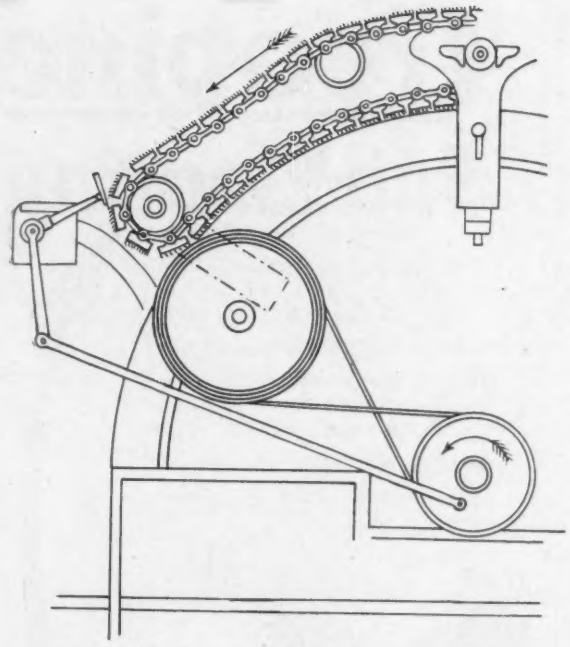
We believe that no more attractive looking harness is made than those which we are turning out right along. The harness looks smooth and feels smooth. The eyes are of just the right size, in perfect alignment and are open just enough to draw in well. The harnesses not only look well but they weave well and wear well.

Willy you write for full description?

TRADE MARK

GARLAND MFG. CO.

SACO, MAINE



A Correction.

Through an inadvertence in the art department, the illustration used with the article "Reverses the Direction of Travel of His Card Flats," in the October number, showed the eccentric arm which operates the stripping comb in this arrangement being driven from the hollow pulley at the end of the flats. This arm should have been connected to the end of the cylinder pulley, and upon request of the writer, Contributor No. 73, we are glad to publish the accompanying drawing showing this eccentric arm connected in the manner indicated in his article.—Editor.

"Taking Hold" on a New Job.

EDITOR COTTON:

This morning on the train I chanced to occupy the same seat with a young carder, who was journeying hundreds of miles to take charge of a card room in a distant state. He appeared to be very nervous, and during our conversation, he confessed that this was his first job and that he dreaded the start, because he did not know how to act or how to begin. I realized his position, and feeling that many beginners must feel the same way, I am going to repeat some of the things I told him, on the chance that they may be of help to other men—or older men for that matter—in taking on a new job.

In taking charge of a card room, I told this young man, get in early in the morning and take the number of every hank clock. As a rule your predecessor will favor himself by taking the clocks a little ahead. Be sure of this point. Then remember and convince yourself that you are the king-pin of the room, and be careful to ask no questions; let them come to you. The greatest mistake made by many new men in taking charge of a room is in asking questions of the help.

After the help are properly placed, begin at the picker room and get every name in the room, and make a note of what machine or machines each man attends. Next get acquainted with the spinner, and ask him to give you immediately a sizing from pick-ups around the room. Then obtain two bobbins from each fine frame and size them, and have the spinner put them in a certain frame and compare this sizing with that of the pick-ups in the spinning room. If a great variation is found, inquire from the second hand if any gears were changed a day or two before your coming. If so, go slow, and look up the carding report for the previous week, and if the fine hank is lighter or heavier than reported, change to the hank roving reported. On the other hand, if very little difference is found in the sizing, size every process immediately and make a record for every process.

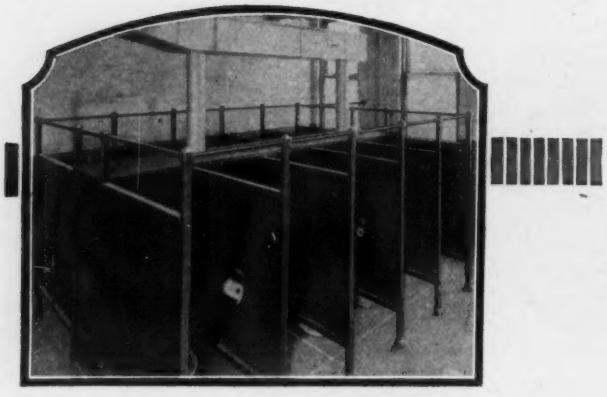
Next obtain the spinning frame draft, and work from the ring frame to the finished lap, as in this example: Number of yarn, 48s. Draft of spinning frame, 8. $48 \div 8 = 6 \times 2$ into $1 = 12$ hank roving. Roving frame draft, 6. $12 \div 6 = 2$ hank intermediate roving. Intermediate draft, 5 (2 into 1) at the intermediate $2 \times 2 = 4 \div 5 =$ .80 hank slubber roving. Draft of slubber, 4½. $.80 \div 4\frac{1}{2} = .177$ hank drawing. Doublings, 6. $.177 \times 6 =$ 1.062. Draft of drawing, second head, 6. $1.062 \div 6 =$ .177. Draft of first process drawing, 6.25. $.177 \times 6 =$ $1.062 \div 6.25 = .169$. Draft of card, 121. $.169 \div 121$ $= .0014$ hank lap or $8.33 \div .0014 = 5950$ grains. $5950 \div 437\frac{1}{2} = 13$ ounce lap.

In this no allowance is made for contraction of twist or other losses, for the reason that the rule is only to get an approximate idea of the weight of the lap per yard. Next, weigh the lap by the yard and in the bulk, and set the standard at every process. Then size the finished drawings twice daily and change the finished drawing when the roving varies from the first day's records.

Watch the amount of roving on hand between the slubbers and intermediate frames. If the intermediates are pulling away from the slubbers, this is a sure sign that the work is coming in heavy, that is, if you have the proper drafts on every machine to balance the two processes when the work is right.

Every carder should understand the construction and peculiarities of the cotton fiber. Hold firmly in mind, if you can, that the cotton fiber is of hollow, spiral or collapsed tubular form, with delicate waxy walls. What does this mean to a carder. (1) Beaters too sharp or too dull, speeded too highly, or of the wrong design, will injure the waxy walls. Too close a setting on the cards will injure the waxy walls, also running the stock through a second time will do this. Let those that advocate running stick waste or waste of any kind please take notice. (2) The atmospheric condition of the room goes a long way toward keeping down the percentage of waste, and when you keep down the percentage of waste, you prevent the stock being run a second time. There are many carders who sit down with the morning paper in hand when they should be watching the thermometer. When the proper atmospheric running conditions get away from you, it means much bad work, a loss of production and poor quality and waste.

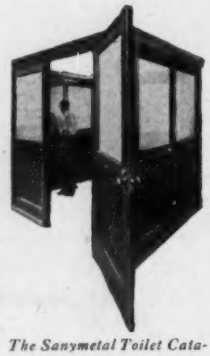
As a rule, very few beginners are good samplers of cotton, and although there are many books on the market dealing with the subject, you cannot learn how to sample cotton from a book. There is only one way to learn and that is to sample it yourself. Sample every chance you get



It's Safe To Say "Sanymetal"

EVER since metal toilet partitions first came on the market, Sanymetal engineers have been tireless in their efforts to perfect their product. The result is a partition that has *always* led the field. When you specify genuine Sanymetal *by name*, you take no chances, you make no experiment. You get a product that has long since proved its fitness to serve—not by claims but by service.

Built throughout of special-analysis, rust-resisting iron. High-grade baked enamel metal-furniture finish. Castings and hardware rust-proofed by electro-zinc plating. Doored compartments fitted with Sanymetal Gravity Roller Hinges, the *original* springless hinge. Doors that cannot bang. Water-shedding base shoe. Unit sections adaptable to any space or layout. Rigid installation assured.



The Sanymetal Toilet Catalog is No. 2—the Office Partition Catalog is No. 4

Sanymetal is made for doored or doorless toilets, urinals, showers, screens, dressing rooms.

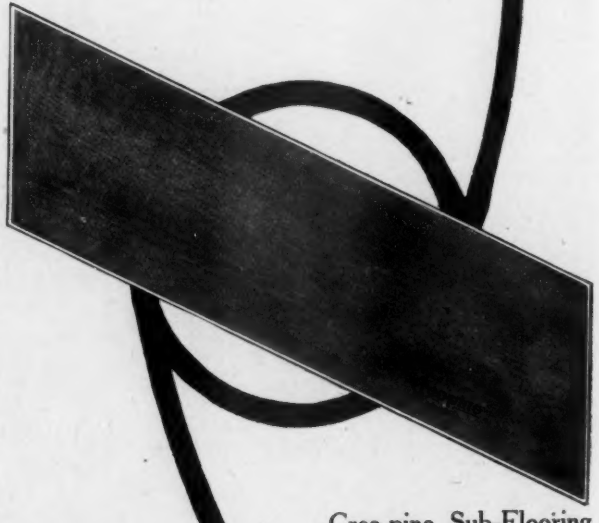
THE SANYMETAL PRODUCTS COMPANY
986 E. Sixty-Fourth St., Cleveland, O.

Sanymetal
TRADE MARK U. S. REG.

Creo-pine Sub-Flooring

Outlasts the factory but costs no more than any first-class untreated, sub-flooring.

Affords uninterrupted production, eliminates floor repair costs, assures durability and top floor stability.



Creo-pine Sub-Flooring —is vacuum pressure impregnated with pure coal tar creosote oil.

Impervious to all deteriorating influences of rot.

"Timber Penetrated by Creosote Oil Will Never Rot."
Bulletin No. 14, U. S. Dept. of Agriculture.

Southern Wood Preserving Co.

Atlanta, Ga.
Station A

Manufacturers of Creo-Pine Block Floors for Heavy Traffic Duty
Shingles that Never Rot
Fence Posts Assured Life 25 to 40 Years.

and notice how each mixing runs. That is, try to remember the nature of the stock in process, and notice whether it gains or loses twist. Then when you get the same kind of mixing, you know what to do. That is what makes a man a good carder. With every mixing he puts in the mixing bin he knows whether the stock will gain or lose twist, and that means less gear changing and less gear changing means more uniform work. The carder able to judge how a mixing will run by sampling is worth his weight in gold to the concern for which he works.

Be ambitious, young man, and have the "pep" and vim, the snap and go, the determination and ambition which spell success. Remember that "As a man soweth, so also shall he reap." And, it might do good to memorize the following lines, so you can say them to yourself in times of especial stress which are certain to come along the way:

"Don't blame the world when things go wrong,
And you have met rebuff;
Don't censure any of the throng
Who choose to call your bluff;
Investigate and you will find
That what I say is true
Don't tell me that this world's unkind,
It ain't the world, it's you."

Wash (Mass.)

Points on Spinning.

EDITOR COTTON:

Cotton spinning is the process of converting roving into yarn, and is done either on the spinning mule or on the ring frame. The roving is delivered to the spinning room after it has passed through the different processes in the card room. The use of the mule is more common in spinning hosiery yarns or filling and for very fine counts. There is less strain on the yarn as there are no travelers used to chafe and strain the yarn. The mule is so arranged that the carriage carrying the spindles spins as it goes out and winds what it has spun onto its spindles as it returns to the roller beam. The roving is drawn through rolls as on the ring frame, and the principle of draft and rollers is the same on both machines. The mule is a complicated machine and requires much more floor space, power and a higher paid and more skillful set of operatives. Ring frame operatives are usually women and children, consequently mills generally use ring frames unless their class of work cannot be produced on them. The ring frame can be used successfully up to 100s.

The two prime aims in a spinning room are quality and quantity, and to obtain them it is necessary to have competent help and then know how to manage them. A manager should never promise the help anything he cannot do. He should always be positive with the help, always kind to them, observing the Golden Rule at all times. He should have a definite system by which to work, and he should see that these plans are carried out. He should conduct himself so all the help will respect him, he should keep them on their jobs, and let them understand they are in the mill to work and not to play. He should be polite, in the mill and outside, and always show them that he is interested in them. If the cooperation of the help can be secured, there will be little trouble in running the job.

An overseer should not depend upon his second hand and section men too much. He ought to make a close inspection of the room a couple of times each day and see that all frames are in first-class order and that the frames and floor are kept clean. This plays an important part in the production and quality of the yarn. The oiler must not be allowed to use too much oil. If he does some of it will get on the yarn and cause bad cloth. There should be a regular time established for oiling, and it should be done right. Not in a manner that will lessen the power of the frame, it should save the life of the frame and reduce the breakdowns.

The matter of travelers is important. The proper weight should be used at all times. If the traveler is too heavy it will be hard to lead and consequently the yarn will be stretched in leading it. More precaution should be used in tying on bands; if bands are too loose the yarn will be soft on the bobbin and it will be hard to pull off; on the other hand, if the bands are too tight, excessive power will be consumed. A good way to determine the correct length of the bands is to mark all of them at a certain point and tie them where they are marked.

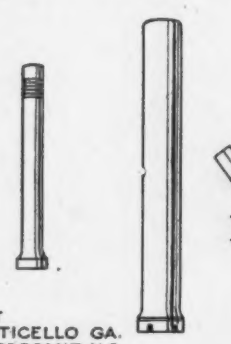
Management and cleanliness—these are two important things in the spinning room, and the overseer and second hand and section men should work together and impress upon the help the importance of these two things.

On coarse work the back leather rolls should be picked once each day and the front rolls twice a day. All the leather rolls should be cleaned the first thing after starting time in the morning, and the front leather rolls should be picked again the first thing after dinner-time. The bottom steel rolls should be cleaned and the stands picked once per week at least. The back guides as they are commonly called should be wiped at least four times a day, say, at 9 a.m., 11 a.m., 2 p.m., and 5 p.m., so they will be clean at stopping time. The sides should be brushed off about every hour and a half, and I will say here that spinners should never be allowed to brush off their sides with a broom as the lint will get into the yarn. The sides of frames on this class of work should be wiped off with card strips. The roving creels should be cleaned at least once a day, the levers or roller weights twice a week. The roller clearers should be picked at least four times a day. They must be kept clean. The ring rails should be cleaned twice a day at doffing time. The rockers or the under works of the frame should be cleaned the first thing in the morning by the doffers and the heads wiped off twice a day, the doffers doing this also.

The floor should be kept clean at all times for a clean floor adds much to the looks of a spinning room. The section man should see that no dirty pieces of waste or pieces of old belts, bobbins, sticks or anything else are on the floor at any time.

The oiling of the machinery is another important matter, and care should be taken to have it done right. The oiler and bander should be a person of good judgment and one in whom the overseer can place confidence. The first thing in the morning the oiler should oil the machines complete—the draft gears, the jack gears, pulleys, cams, bearings, traverses, cylinder joints, and bearings, and front steel roll joints or front stands. When he gets this done he should band around.

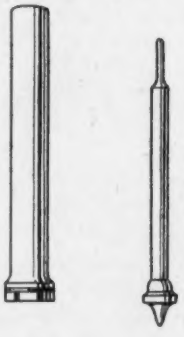
In tying on a band care should be taken to tie just as small a knot as possible, to give the spindle a more uniform speed and to prevent too great a percentage of slippage.



JORDAN
MANUFACTURING COMPANY
BOBBINS

MILLS AT
MONTICELLO GA.
AND TOECANE, N.C.

MONTICELLO, GEORGIA



COTTON MILLS SHOULD USE Commercial Acetylene For Welding

Supplied in portable cylinders on loan basis without deposit.

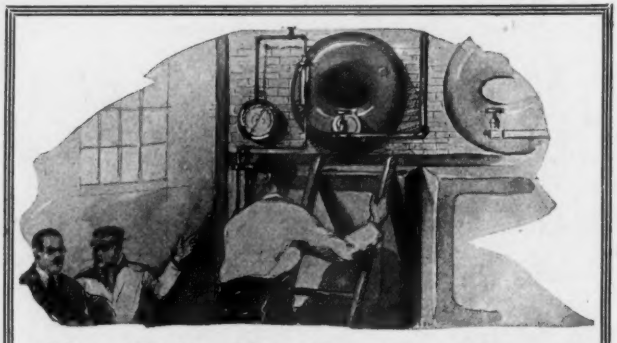
Only the purest gas can safely be trusted to meet the exacting demands for cotton mill welding repairs. Commercial Acetylene is a gas of absolute purity.

WRITE FOR OUR SERVICE AGREEMENT

Commercial Acetylene Supply Co.

204 Trust Company of Georgia Bldg., Atlanta, Ga.
Main Office: 80 Broadway, New York City
203 S. LaSalle St., Chicago

Aurora, Ill. — Boston, Mass. — Bound Brook, N. J.
East Deerfield, Mass. — Toronto, Ont. — San Francisco, Cal.
Moberly, Mo. — Berkeley, Cal.



Clean Tubes Mean Less Coal Burned

DIXON'S PIONEER BOILER GRAPHITE

"Well," said the Chief to the G. M., "Dixon's Pioneer Boiler Graphite has certainly scored big for us. We are using less coal now, because our boilers and tubes are thoroughly clean—the coal pile tells that. In addition to the big saving in coal bills, our boiler cleaning cost has dropped to a quarter of what it was, and the efficiency of the boilers materially increased."

"Here is the point," continued the Chief —"Dixon's Boiler Graphite has ousted that bad scale from the tubes, drums and every part of the front and rear headers, where it was always difficult to remove it before. Thus only clean metal is left to transmit the furnace heat."

"The test tells the story," replied the G. M.—"and fully supports the assertions made in Dixon's booklet—'Graphite for the BOILER.'"

If you haven't a copy, it will interest you. Ask for No. 34-T.

Joseph Dixon Crucible Company

Jersey City, N. J., U. S. A.
Established 1827

"ATLANTA" HARNESS

"Quality and Service That Satisfies"

ATLANTA HARNESS & REED MFG. CO.
ATLANTA, GA.
P. O. Box 1375
Telephone Main 517

50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES

have been added to the "1912" Cloth Cutting, Folding and Winding Machine which add at least 50 per cent to its value to YOU.

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from each bolt of cloth.

It cuts the corners of expenses in every way and leads to more and greater profits.

THE ENORMOUS SAVING WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write us.

J. A. FIRSCHING, 614 Broad St., Utica, N. Y., U. S. A., Dept. "C."

After the oiler has finished banding around and the spinners have picked their rollers, the oiler should oil the rollers.

On coarse work the rollers should be oiled once a day, the oiler taking care to put the oil directly on the ends of the rollers and on the wool inserted in the saddles, with the use of a good drip cup. The oiler can oil the rollers without smearing oil on the leather bosses, which, if done, will make the leather rot and ruin. On medium yarn the front rolls should be oiled once a day and the back rolls three times a week. On fine yarns the front rolls should be oiled three times a week and the back rolls once a week. The front steel rolls should be oiled once per day, the middle and back rolls twice per week. Care should be taken to not get too much oil on the rolls. A good rule is to put about two drops to the stand.

Some men try to line spinning frames by means of a cord. But to my way of thinking a better plan is to put the steel rolls in the stands and raise the roll with the finger, up and down, and set the stand so there will be no binding in it. I have tried both rules and find the latter the better. In setting the steel rolls to the different lengths of staple all experienced mill men know that the difference from center to center of the rolls must slightly exceed the length of the staple. I am aware of the fact that on a fast speed the setting of the rolls should be wider than on a slow speed for the simple reason that if on fast speed the rolls are set wider it will give the fibers more space and time to become parallel with each other.

The twist of the yarn has a great deal to do with the running of the work in mills where combers are not in use, and it is necessary to card heavy to keep up with the drawing. More twist can be placed in the yarn than the figures call for, and this is better for the reason that it will make the yarn better and stronger. For example, suppose on heavy carded stock we are spinning 36s. The standard twist would be the square root of 36, which is 6, multiplied by 3.25, which is 19.5 turns, but it will be found better to put 21.5 turns in the yarn, which is 2 turns more than the figures call for. But on combed stock, where a good percentage of waste is taken out, less twist can be put in the yarn than the calculations call for.

Too much drafting should be avoided as this will cause the work to run badly, while if a good draft is kept it will be found that the yarn will be stronger and more even. To my way of thinking the draft should never exceed 12 nor come under 7. Where it is nip and tuck for the card room to keep up with the spinning room the spinner should draft as long as possible without hurting himself so as to give the carder an advantage. When should travelers be changed is a question which many overseers cannot agree upon; to my opinion, where hosiery yarns are made and a lot of changing from one number of yarn to another is done, there is but little use to change the travelers at all, except when changing to different yarn, unless the overseer just wants to change his travelers to satisfy himself that he has on a good lot of travelers.

The main thing about spinning is for the overseer to keep on the job, keep his frames in good shape and well oiled, keep an eye on all changes to see that they are right, see that all bands are of the same size and tied on correctly. When the overseer himself keeps on the job then everyone else can be expected to do likewise. Bob N. C.)

The Employment Manager.

EDITOR COTTON:

For some months I have been a very interested reader of the letters in COTTON on the subject of "The Employment Manager," noting the argument for and against this form of employing help. It seems to me, both from observation and from experience, that most of the writers on this subject have failed in one respect; that is, they have not so far brought out the reason why the employment manager was first installed, or in other words, the reason for the existence of this position at all. What I am about to write I hope will be criticized freely, and shall be pleased to exchange views on this subject, as none of us know it all, and far be it from me to give this impression.

For a period of four years I was overseer in a mill where we had an employment office, and, to be fair, I will say that I was as bitter toward this as any overseer ever was at its inception; and remained this way for a period of say six months afterwards, slowly becoming reconciled to the fact, not that this was the ideal form of hiring and discharging help, but that as a cure for the shortcomings of a certain type of overseer, it was a necessary evil.

That this is not and never will be the best method of employing help has been proven time and time again, because no one can dispute the fact that the man to decide whether a man seeking work is the type of hand he wants is the man on the job and who has to handle the help. On the other hand, the day of the autocratic overseer or superintendent is definitely over, if it ever existed. I may be wrong—if so I am open to conviction—but I believe that 90 per cent of the labor turnover is caused by inefficient overseers, and I am in a position to furnish facts to prove my statement. I well remember one incident which came to my attention and which I will relate here. Two overseers in the same mill on the same class of work—overseers of weaving they were, and each had charge of 1,000 Draper looms. In one case the labor turnover was 5 per cent and in the other case the labor turnover was 800 per cent. Now what was the matter? Through the persistent efforts of the employment manager the trouble was finally located and rectified, although I must say that in order to accomplish this it was necessary to warn the overseer in question that if he did not show a little more cooperation in the matter he might have to be replaced by someone who would.

I wish to present to you a few of the difficulties as they were developed in this particular instance. First, it was noted that employees who had at some previous time worked for other overseers had a splendid record behind them, but upon coming to work for this man—the 800 per cent overseer—there was trouble right away which would finally wind up in their leaving, sometimes within a few days, and sometimes within a few weeks. In order, therefore, to make a test on this matter the employment manager asked for and obtained permission to re-hire some of these dissatisfied hands and put them to work in other parts of the mill.

This at first caused considerable comment, as this was in direct opposition to the general policy of the management. The result, however, was that the same hands who were before classed as unsatisfactory, low class help, became some of the best workers in the plant.

Then a consultation was called between the employment manager, the superintendent, the 5 per cent overeer and

BLEACHERS!

Call the attention
of your selling agent
to your ability to furnish
"Better Bleached Goods"
through Peroxide bleaching,
giving a permanent white
without weakening, at same cost.

Those selling points
will increase his sales,
without price cutting.

We are experts.

THE ROESSLER & HASSLACHER CHEMICAL CO.
NEW YORK

the 800 per cent overseer, and I can tell you that it was some session. First the overseer with the 5 per cent record was asked to air his views on the treatment of help in general, which he did somewhat as follows: "Help," he said, "are human, first, last and always. Now and then you may find one who has apparently lost this trait, but not very often. This being established, then it must of necessity follow that to be successful in handling help you must be somewhat of a student of human nature. Also keep this fact in mind: when you have thoroughly tested a formula for keeping one operative happy and contented, make that an individual formula and do not try to make its application general, else you are bound to failure because no two human beings are alike. Gentlemen," concluded he, "that is my viewpoint, and my only method of handling help."

The 800 per cent overseer was next asked to state his views on the matter, and he replied somewhat as follows: "When a hand is not satisfied, I tell them if they don't like it to get out."

"Excuse me a minute," interrupted the superintendent, "but do I understand you to mean that when a hand is not satisfied with conditions you tell him to get out?" "Yes," replied the overseer.

"But," said the superintendent, "who created these conditions, you or the workers? Don't you think it might help if you were a little more pliable and found out what the viewpoint of this dissatisfied hand was before curtly dismissing him in this fashion?"

The overseer thought this over for a few minutes, but even then understanding failed to dawn on him as was shown by his answer: "Yes, but I am running the job and I can't have everyone giving me suggestions as to how to run it." At this point the employment manager spoke up. "Let me make a suggestion," he said. "Suppose you should listen occasionally to some of these complaints; does it not seem reasonable to you that you might at least get their view of the matter and from this you might get some idea of the cause for so much changing of hands in your department?"

Right here the superintendent spoke again, and what he had to say summed up the whole matter pretty well. "Gentlemen," he said, "I did not previously grasp the serious side of this matter, but allow me to say that I now am fully awake and here is my opinion on this subject." Turning to the 800 per cent overseer, he continued, "It is just such men as you who caused the employment department to come into existence. It had to be put in the mill to afford some measure of protection to the help from men of your type. Now if your labor turnover is anywhere near as large three months from now you might begin to look for another position. You are a good man and know how to handle your work, but so far you have not learned how to handle help." To the 5 per cent overseer, he said, "I used to look upon a man who spoke of his help problem as you did today as being somewhat of a freak, but when I look at your records, production, seconds, waste, etc., and then pause and think of what you said a short while ago I apologize for ever having thought that way of any man who speaks as you did."

"Now, Mr. Employment Manager," continued the superintendent, "until such times as we can eradicate a certain type of overseer from our midst, we need you and need you badly. You are not a real remedy for the help problem, because your function is to get help and you will

always be looked upon as a meddlesome nuisance by unthinking people. You can never hold the help; that is the job of the good overseer. What we need is an overseer who can get help because he uses the workers that he already has in a square manner, giving them a chance to prove their merit, who can help the workers for the same reason, who can get production because he has contented help who give him willingly of their best efforts."

I was a member of that conference—which one, I leave to your imagination. The formula as voiced by the 5 per cent overseer is worthy of everyone's attention. "Try it."

Benjamin (Conn.)

Sodium Peroxide as a Bleaching Agent.

(*Continued from page* 42.)

sulphuric acid and containing a little blueing. They should be rinsed and before finishing should be passed through a solution of gelatine containing a little acetic or citric acid for scroop.

The quantities of materials given in this article are only given as indicators, they are liable to vary under local and other conditions, even some of the recipes given apparently vary, being from different localities and used under different conditions. Each peroxide manufacturer, however, has his own formula and can give his clients the best dope for his own product. The author's idea is to present the general conditions.

Good Carding.

EDITOR COTTON:

Good carding is the aim of every mill working for a superior product. Without good carding, only a faulty product can be the result. The difference between good carding and bad carding will be apparent on the face of the goods. It is impossible to conceal poor carding. Even though the customer may have never worked in a mill, the difference between good carding and poor carding will be noticed just the same. The customer may not know the reason for the difference, but the expert observer will know at once that the cotton in the cloth has either been well or poorly carded.

For these reasons it is imperative to have the best of carding to avoid a very conspicuous deficiency in the goods. Besides making poor goods, poor carding will make poor running work. And poor running work will make more waste and cost more in labor to produce the goods. Therefore, poor goods cost more to produce, and sell for less, and also with greater difficulty. All this goes to prove that poor carding is a very undesirable proposition. A mill cannot afford to neglect the carding.

The product of poor carding is neppy, linty, specky, and filled with uneven stretches of yarn, also the surface of the cloth will be broken up by many more knots and splicings in the yarn than should be necessary. The cloth will have a harsher and less desirable feel. It will have a cheaper feel no matter how much effort is made to conceal it in the finishing processes. Calendering will merely flatten down the knots, bunches, neps, specks, and thick yarn spots and greatly exaggerate the trouble that already exists. So it will not do to try to overcome the cheaply carded goods by calendering under pressure. If the goods are brushed the face of the cloth will be linted and cheapen the appearance. If the goods are starch-filled and an artificial face is thus applied to the cloth, it will take away that "cottony" feel which is so easily discerned by even the inexperienced person. It will not feel so "clothy" or "weavey." People who buy cloth want it to feel like cloth and not like slabs.

In other words, if the face of the cloth is starch-filled, it will have a coldness to the touch which does not respond and will lack that granular feel which is so characteristic of a purely finished, well carded piece of cloth. It is a dead give-away. There is something missing which cannot be replaced.

All this goes to show that the only salvation of the cloth producer is to look well to his carding and never let it get below the par of excellence. That is why most mills are so choice of their carding. The best of carders are in good demand. The secret of good running work and of making perfect yarns and woven goods is to have the best of carding. This means a great deal of excellent service to be performed at the right places to accomplish this desired end. Good carding does not begin in the card room. It begins at the cotton mixing pile. The best of carders understand this important point very well. Others ignore it.

Some small mills open anywhere from one to two or four bales of cotton at one time. And even some of the very large mills do the same way. And worse than this, they lay the bales of cotton on the floor near the picker and feed the stock into the hopper right from the bales, leaving the matter entirely to the judgment of the inexperienced picker tender.

Very poor carding starts in this way. Good carding starts in a better way. Sufficient cotton should be opened to last three days to a week in two different places. Cotton is used from one pile, while the stock is seasoning or ageing in the other pile. This adds much to the value of a good cotton mix preparation. For want of good judgment in cotton mixing, some mills have used all of their good cotton at one time, and all of their poorer cotton at another time. This wide discrepancy makes too much difference in the work and plays havoc with what should be good carding. A wise mill agent made the strong statement in a paper read before the National Association of Cotton Manufacturers some years ago, that a very careful mixing of the cotton before running through the picking processes, was as good as raising the cotton to be used to one grade better. This is the equivalent of buying a grade of cotton at the price of one grade lower, or else stock can be used which is one grade lower, and then raising it to one grade better by careful mixing. Too much attention cannot be given to the grading, stapling, selecting and mixing of cotton. It will mean much better carding, much better running work, and a superior quality of finished fabric.

Now, with reference to running this cotton through the pickers. A great deal of cotton is beaten to its ruination by high speed beater blades. Expert carders are now slowing down the speed of the beaters. Where our carders of a generation ago were driving the beaters up to 1,600 r.p.m., beaters are now found to operate commonly at speeds of 1,000 to 1,200 or 1,400 r.p.m., depending on the length of staple used. Carders have figured this down very finely. They have even announced in previous papers the total number of fibers there are in a pound of cotton and just

DIRECT COTTON COLORS

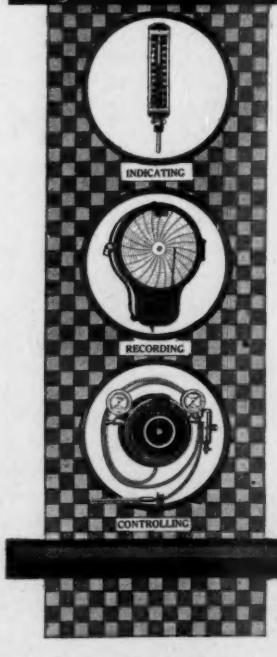
CENTRAL DYESTUFF & CHEMICAL CO.

MAIN OFFICE AND WORKS: NEWARK, N. J.

ESTABLISHED 1898

An Ever
Increasing Demand
For
"AMTEX"
SPINNING, TWISTING AND SPOOLER TAPES
From
Southern Spinners
THE QUALITY AND PRICE RECOMMEND THEM
Manufactured by
AMERICAN TEXTILE BANDING CO., Inc.
GERMANTOWN, PHILADELPHIA, PENNA.
Sold in the South by
Charlotte Supply Co., Charlotte, N. C.
James Supply Co., Chattanooga, Tenn.
Montgomery & Crawford, Spartanburg, S. C.

Tycos temperature instruments



Correct temperature control during the cooking, application and drying of the size increases the strength of the yarn without an appreciable increase in the weight.

Tycos Instruments solve other temperature problems in the Textile Industry just as easily.

Taylor Instrument Companies
ROCHESTER N.Y.

850 Theres a *Tycos* and *Taylor* temperature instrument for every purpose

how many fibers are struck per blow of the beater blades at each revolution. This is not difficult to figure—if there are about 140,000,000 fibers of ordinary cotton in one pound, and six pounds are passing through the finisher pickers per minute, this will total 840,000,000 fibers passing through the beater blows per minute. If the beaters are revolving 1,000 r.p.m., each blade of a two-blade beater will strike 420,000 fibers per blow. If the beaters are going 1,500 r.p.m. only 280,000 are struck at each blow of the beater blade; 280,000 fibers being struck at one time do not offer so much resistance nor form so much cushion for the severe blow of a beater blade as does the mass of 420,000 fibers that are struck by the lesser speed.

It also makes much difference as to what kind of an edge the beater blades have. If they are too sharp or too ragged the top layer of this mass of fibers will get a knock-out blow that spoils it for good carding. Again, if the beater blade is too dull or too rounded, the blow will prove ineffective so far as driving out any foreign matter is concerned. The beater blades need to be neither sharp nor dull; just the right shape and edge is needed to hit the stock a glancing blow which will slide onto and past the mass of fibers with a combing effect. So far as the three-blade wire clothed beaters are concerned, these are usually run slower. While they are well adapted for some stocks, there seems to be a difference of opinion among expert manufacturers as to which class of beaters is preferable. This may be for want of knowing how to set the machines to meet the requirements of each. It makes a difference, for various lengths of staples, how near the feed rolls or feed plate is set to the beater blades.

Expert carders are competent to determine these points by preliminary tests, before allowing the work to pass through in quantities. Expert cotton manufacturing does not consist so much in knowing by heart rules and combinations in particular, as it does in the art of knowing how to find the right working points to give the best results. This is because the fine and right working points migrate or shift according to varying stocks and varying local conditions. This is also the reason why all of cotton manufacturing cannot be learned in a textile school. Whether a man learns the basic rules and gets his preliminary training in a textile school or in a regular mill, he will be obliged to secure his superior and expert training by an endless amount of hard work, observations and closer study of textile mechanics which will give him an experience which cannot be bought at any price. He must get into the actual operations of the work under the inevitable varyings which come and which cannot be dodged.

Taking our well opened and uninjured stock to the carding machine itself, we now have another one of those great textile problems, and one which embodies all of the principles just related, viz., knowing how to find the right working points which cannot be told in books. There is no "pass word" to the working points avenue. The expert carder often has to blaze his own trail, and find his own best working points. These working points cannot always be advanced to him by the ordinary channels of passing out information. He must advance himself up to these proper working points long before there are any serious troubles arising from a deferred application of skill. This means that these working points must not only be found, but they must also be found rapidly, before failure sets in. This means knowledge of the work, plus experience, plus speed or expediency in service.

Running a mill is like operating an automobile, knowing its working parts is one thing, and to operate it safely the operator must have had experience, and experience which gives him the confidence to act rapidly at the right moment in order to avoid in time what should not occur.

So, at the carding machine, the mill requires and wants good carding immediately. There is no time to fool around and carry on useless experiments. The expert carder has a few well known alternatives to apply, and he does this in good time to find the proper working points without needless delays and waste making stunts.

The first thing that the cotton lap will be seized by will be the licker-in. A large number of licker-ins are always in poor shape. The teeth are either too dull, worn down too short, improperly ground, burred on hooking, or else too many teeth are missing. The common licker-in has just enough teeth in the clothing to have one tooth glide by each fiber one time, as the cotton passes around or by this important part of the carding process. If the teeth are missing or a large number of them are inactive, many fibers must go without service. The service performed by the licker-in is to splash into the mass of cotton a spreading blow between the fibers which prepares them for the finer grasp of the carding cylinder. To give the proper results, the teeth must be in the right shape to accomplish this without the possibility of injuring the fibers. Each fiber has only a certain amount of strength, and it does not take much to injure this frail strength. If the licker-in teeth are given a chisel point, as is often the case, many fibers are literally chopped at and stricken down and out like a small tree would be with a single blow of an ax. If the teeth are burred or hooking, the fibers will be grasped in a cruel manner and be carried around the licker-in longer than they should be. They are not so readily released, and the grabbing face of the cylinder, instead of being the gentle recipient of the fibers, will actually tear the fibers away from their fastenings on the face of the licker-in. All of these things not only weaken the yarns and make undesirable fabrics, but also make much waste of stock and besides the two things mentioned, it will require much more work to put the goods through the subsequent processes. These three bad things are very undesirable and make a wicked combination.

The remedy is to have good clothing on the licker-in and to have the teeth all needle pointed. The licker-in should never be faced or ground with a brick or stone of any kind. Grinding and burnishing with the proper tools is the only proper way to keep licker-ins in good order. It will pay any mill to look well into the condition of their licker-ins and see that they are never neglected. This important part of the carding machine is a foundation builder for the rest of the card. It is commonly the first process of combing between the fibers, and instead of receiving a knock-out blow they should receive a welcome blow.

Besides giving the fibers their first combing process at this point, the stock also receives a very important cleansing process which is different from any cleaning process yet received. The pickers can spread the stock quite evenly and dust it, and drive out the cotton seeds and other coarse foreign substances, but the finer substances are passed on,

DIRECT COTTON COLORS

CENTRAL DYESTUFF & CHEMICAL CO.

MAIN OFFICE AND WORKS: NEWARK, N. J.

ESTABLISHED 1898

An Ever
Increasing Demand
For
"AMTEX"
SPINNING, TWISTING AND SPOOLER TAPES
From
Southern Spinners
THE QUALITY AND PRICE RECOMMEND THEM
Manufactured by
AMERICAN TEXTILE BANDING CO., Inc.
GERMANTOWN, PHILADELPHIA, PENNA.
Sold in the South by
Charlotte Supply Co., Charlotte, N. C.
James Supply Co., Chattanooga, Tenn.
Montgomery & Crawford, Spartanburg, S. C.

Tycos temperature instruments

Correct temperature control during the cooking, application and drying of the size increases the strength of the yarn without an appreciable increase in the weight.

Tycos Instruments solve other temperature problems in the Textile Industry just as easily.

Taylor Instrument Companies
ROCHESTER N.Y.

850 Theres a *Tycos* and *Taylor* temperature instrument for every purpose

how many fibers are struck per blow of the beater blades at each revolution. This is not difficult to figure—if there are about 140,000,000 fibers of ordinary cotton in one pound, and six pounds are passing through the finisher pickers per minute, this will total 840,000,000 fibers passing through the beater blows per minute. If the beaters are revolving 1,000 r.p.m., each blade of a two-blade beater will strike 420,000 fibers per blow. If the beaters are going 1,500 r.p.m. only 280,000 are struck at each blow of the beater blade; 280,000 fibers being struck at one time do not offer so much resistance nor form so much cushion for the severe blow of a beater blade as does the mass of 420,000 fibers that are struck by the lesser speed.

It also makes much difference as to what kind of an edge the beater blades have. If they are too sharp or too ragged the top layer of this mass of fibers will get a knock-out blow that spoils it for good carding. Again, if the beater blade is too dull or too rounded, the blow will prove ineffective so far as driving out any foreign matter is concerned. The beater blades need to be neither sharp nor dull; just the right shape and edge is needed to hit the stock a glancing blow which will slide onto and past the mass of fibers with a combing effect. So far as the three-blade wire clothed beaters are concerned, these are usually run slower. While they are well adapted for some stocks, there seems to be a difference of opinion among expert manufacturers as to which class of beaters is preferable. This may be for want of knowing how to set the machines to meet the requirements of each. It makes a difference, for various lengths of staples, how near the feed rolls or feed plate is set to the beater blades.

Expert carders are competent to determine these points by preliminary tests, before allowing the work to pass through in quantities. Expert cotton manufacturing does not consist so much in knowing by heart rules and combinations in particular, as it does in the art of knowing how to find the right working points to give the best results. This is because the fine and right working points migrate or shift according to varying stocks and varying local conditions. This is also the reason why all of cotton manufacturing cannot be learned in a textile school. Whether a man learns the basic rules and gets his preliminary training in a textile school or in a regular mill, he will be obliged to secure his superior and expert training by an endless amount of hard work, observations and closer study of textile mechanics which will give him an experience which cannot be bought at any price. He must get into the actual operations of the work under the inevitable varyings which come and which cannot be dodged.

Taking our well opened and uninjured stock to the carding machine itself, we now have another one of those great textile problems, and one which embodies all of the principles just related, viz., knowing how to find the right working points which cannot be told in books. There is no "pass word" to the working points avenue. The expert carder often has to blaze his own trail, and find his own best working points. These working points cannot always be advanced to him by the ordinary channels of passing out information. He must advance himself up to these proper working points long before there are any serious troubles arising from a deferred application of skill. This means that these working points must not only be found, but they must also be found rapidly, before failure sets in. This means knowledge of the work, plus experience, plus speed or expediency in service.

Running a mill is like operating an automobile, knowing its working parts is one thing, and to operate it safely the operator must have had experience, and experience which gives him the confidence to act rapidly at the right moment in order to avoid in time what should not occur.

So, at the carding machine, the mill requires and wants good carding immediately. There is no time to fool around and carry on useless experiments. The expert carder has a few well known alternatives to apply, and he does this in good time to find the proper working points without needless delays and waste making stunts.

The first thing that the cotton lap will be seized by will be the licker-in. A large number of licker-ins are always in poor shape. The teeth are either too dull, worn down too short, improperly ground, burred on hooking, or else too many teeth are missing. The common licker-in has just enough teeth in the clothing to have one tooth glide by each fiber one time, as the cotton passes around or by this important part of the carding process. If the teeth are missing or a large number of them are inactive, many fibers must go without service. The service performed by the licker-in is to splash into the mass of cotton a spreading blow between the fibers which prepares them for the finer grasp of the carding cylinder. To give the proper results, the teeth must be in the right shape to accomplish this without the possibility of injuring the fibers. Each fiber has only a certain amount of strength, and it does not take much to injure this frail strength. If the licker-in teeth are given a chisel point, as is often the case, many fibers are literally chopped at and stricken down and out like a small tree would be with a single blow of an ax. If the teeth are burred or hooking, the fibers will be grasped in a cruel manner and be carried around the licker-in longer than they should be. They are not so readily released, and the grabbing face of the cylinder, instead of being the gentle recipient of the fibers, will actually tear the fibers away from their fastenings on the face of the licker-in. All of these things not only weaken the yarns and make undesirable fabrics, but also make much waste of stock and besides the two things mentioned, it will require much more work to put the goods through the subsequent processes. These three bad things are very undesirable and make a wicked combination.

The remedy is to have good clothing on the licker-in and to have the teeth all needle pointed. The licker-in should never be faced or ground with a brick or stone of any kind. Grinding and burnishing with the proper tools is the only proper way to keep licker-ins in good order. It will pay any mill to look well into the condition of their licker-ins and see that they are never neglected. This important part of the carding machine is a foundation builder for the rest of the card. It is commonly the first process of combing between the fibers, and instead of receiving a knock-out blow they should receive a welcome blow.

Besides giving the fibers their first combing process at this point, the stock also receives a very important cleansing process which is different from any cleaning process yet received. The pickers can spread the stock quite evenly and dust it, and drive out the cotton seeds and other coarse foreign substances, but the finer substances are passed on,

like fine leafy matter and neps, broken seed parts, etc. Here is where the licker-in comes to the rescue. With proper settings of the mote knives, and the right kind of grid bars, the neps and similar objectionable matter will be literally cut out or glided out. The action of the mote knives is quite similar to the work done by some of the knife attachments to the saw gins, in the process of cotton ginning.

Therefore, the licker-in combs and cleanses as a first process of this combination at one point. There are other important considerations to look out for. They are the settings of the feed plate to the licker-in, the settings of the screen and the mote knives to the licker-in, as well as the setting of the licker-in to the cylinder. As no set rules can be laid down for all cases, and as these settings vary with different stocks used and with local conditions and experiences, we must leave these settings to the carder to judge for himself. We only aim to bring out other important points which are often overlooked by those who would learn the true art of good carding, which is so necessary for the proper manufacture of reliable yarns and choice fabrics like dress goods, shirtings and sheetings.

So far as the care of the cylinder and the doffer is concerned, also the revolving top flats, these usually receive good average attention. Many card rooms have these parts in excellent condition, while at the same time their lickerins are unfit for use. It is the same way with the settings of the card. Attention is often especially given to the settings of the doffer, licker-in and top flats. But so far as the rest of the card is concerned, not so much skill is always applied. In fact, there are quite a few carders and many card grinders who do not know how many setting points there are on a card, much less knowing how to set them. There are no less than 24 kinds of settings, calling the top flats one kind of a setting, etc.

All of these working points and settings were made and are on the machine for a purpose. Machinery men are not putting any extra parts on a machine for the fun of seeing them there. Mill owners are not paying good money for useless parts of machinery. And machinery builders are constantly studying to simplify their machinery. Every part has its particular and peculiar function to perform. Each part has a certain range of setting which will give the stock the best treatment necessary to manufacture the best goods. Outside of this range, either extreme of too much or too little will injure the work of the process.

Every manufacturing head, and his assistants down to the card grinders, should thoroughly understand the entire card. The card grinders should be well schooled in the requirements of expert card grinding. To this end our textile schools should specialize in this one particular phase of workmanship. Each school should have a special class in card grinding and turn out competent card grinders for the mills. This should also apply to loom fixers. A large mill should have a training department for this purpose alone—to train its own card grinders under their own expert, who will drill the men into the proper setting of their cards for the special work made in the mill. Grinding cards in many cases is done too heavily. It is better to grind cards lighter and oftener. Irreparable injury can be done to the wires by grinding the clothing too hard or too heavily. All card clothing should be ground in a manner which will give to the wires as nearly a needle point as possible. Every one of these needle points is necessary to properly work between the fibers and lay them straight, and to comb out the impurities from the passing fibers in their journey through the card.

Nothing but the best kind of clothing, the best of grinding, and the best of settings at each point will give satisfactorily carded stock. Good carding will have a clear even web, it will not appear as though it was moth-eaten, and it will be free from cloudiness, thin spots, neps or leaf. The selvages will be straight and firm. The fibers will be as nearly well lined up as any carding machine can impart to a mass of cotton which was a few moments ago a tangled lot of cotton with the fibers not only pointing in every possible direction, but also curled and snarled together. Some of them are still gummed and stuck together. Others are clinging to the seed particles. Still others are caught upon the ragged edges of leaf remnants. Short fibers are also in the way in vast numbers to interfere. There is yet lurking in the cotton, sand, dust, moisture, natural cotton oils and other foreign substances.

The wonder is that the card does anywhere nearly as well as it does. But the card is a superior machine, a wonderful combination of working points. It requires skill to handle cards, and they generously respond to the work of a skillful mechanic. And just in proportion as skill is applied to the preparation of the stock for the carding machine, and in the same ratio as the cards are given expert service, just so will the carded stock show after coming through the card. Spoiled carding should never be allowed to proceed beyond into other processes. It is better to return it to the picker room. But even this does not fully remedy the trouble. It will cost extra to rework the stock, and besides, each time that stock is re-worked it is weakened and makes more waste. Perfect manufacturing conditions demand that machines do the best work the first time the stock passes through them.

Expert superintendents, when passing through their card rooms, will frequently stop cards that have the slightest appearance of not producing the right work. No man can risk his reputation with imperfect carding. Perfect carding is imperative. Poor carding has cost many a man his job and made holes in his reputation. And the matter of poor carding has also wrecked the success of some mills entirely. No man or mill can afford to slight the carding. Give it the highest range of service available, and this service will be reflected upon the face of the goods at sight.

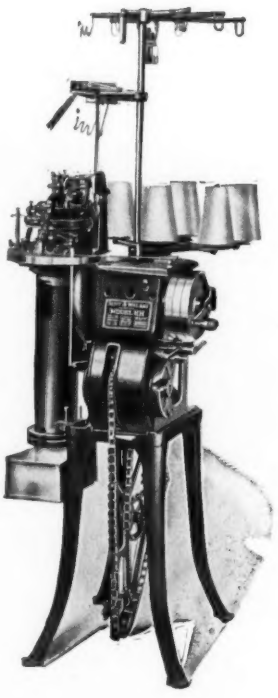
H. D. Martin (R. I.)

Sir James Farmer & Sons, Ltd., Salford, Manchester, England, perhaps the largest manufacturers of English textile finishing machinery in the world, have appointed James F. Monaghan, 52 Chauncy St., Boston, Mass., as their representative in the United States and Canada. This concern will enter the American market with equipment for bleaching, dyeing, finishing, mercerizing and printing plants for cotton and linen, raw stock, yarns and piece goods. Mr. Monaghan will furnish engineering for the company, and breakdown and repair services will be furnished at the Macomb Machine Company's plant at Waltham, Mass., where sufficient patterns and repair parts will be carried in stock to allow for prompt delivery of such service necessities as may arise.

KNITTING SECTION

NEW MODEL H-H

Producing Ribbed Top Half Hose Complete



Ribber top made on two sets of needles.

Automatic transfer from ribbed stitch to plain.

Eliminating necessity of skilled help.

Saving of raveling waste which occurs when topped by hand.

Each stocking is dropped from the machine when finished.

Each stocking is automatically started upon the empty needles, producing a French welt without drawing thread or cutting, no ends of any kind to be removed.

Machine is fitted with five yarn fingers.

Provision is made for high spliced heel and double sole.

Provision is made for ring top and ring toe.

Speed of machine about the same as Model K.

Production about twelve stockings per hour on 3¾" 220 needles.

One operator can take care of the same number of machines as Model K.

The machine is built in all gauges.

ESTABLISHED 1865

SCOTT & WILLIAMS

INCORPORATED

366 Broadway **New York**

Hamilton, Ont.
Main and McNab Streets

Charlotte
1006 Realty Building

LEESONA REG. U.S. PAT. OFF.

LEESONA REG. U.S. PAT. OFF.

"The 'Universal' People Were Right"

"I hold the positive proof right here in my hand—comparative production records for three months, during which time we have been feeding half our spring needle knitting machines from SUPERCONES and half from bottle-bobbins.

"We went at the matter of installing 'UNIVERSAL' No. 80 Winders cautiously. We didn't clean out the entire old equipment at once. We wanted to be absolutely *sure* before we got in too deep.

The "UNIVERSAL" people said, "Do it that way if you prefer. But at the end of your trial period you'll admit it has cost you money."

They were right, and our order for the rest of the necessary SUPERCONERS (UNIVERSAL" No. 80's) goes into this afternoon's mail.

It costs nothing, involves no obligation whatsoever, to send for a "UNIVERSAL" Engineer to investigate winding conditions and costs and to give proof positive of what the SUPERCONES will do in mills using Spring Needle Knitting Machines.

Write today for a "UNIVERSAL" Engineer to come to you

UNIVERSAL WINDING COMPANY

Providence, Chicago, Utica, New York.

LEESONA REG. U.S. PAT. OFF.

BOSTON

Philadelphia, Charlotte, Atlanta.

DEPOTS AND OFFICES AT MANCHESTER AND PARIS

Checked Styles in Knitted Fabric

BY WILLIAM DAVIS. M. A.

There has recently been a very large increase in the scope of knitted fabric design and all styles of patterns are now finding their place on the market. The making of purl stitch fabrics has not been quite so popular for some years owing to the fact that to produce them distinctly different types of machines are required and no sooner have you installed a plant of these than you have to bring in a fresh lot of a different gauge and the demand goes on to an entirely new fabric before you have been able to recoup yourself for your outlay in purl stitch machinery.

The purl stitch has very special qualities of its own in that different types of texture can be obtained quite distinct from what is possible on other makes of knitting machines. When you have made a range of designs on the average purl stitch machine of the usual stripe and basket effects, you begin to repeat yourself unless you go to the expense of installing a Jacquard set of machines which are a great source of trouble and expense in addition to requiring special skill to operate and control. There are also serious limitations to the purl stitch fabric, for at best it is a single texture and you have not the same opportunity for producing thicker and heavier fabrics by making the tuck stitch as in the ordinary flat knitting machine.

In the basket patterns where you have a bass of face stitch alternating with a bass of back fabric stitch, you often have a kind of opening where the stitch changes, also unless special precautions be taken the back fabric square tends to raise itself on to the surface of the texture unduly and disturbs the equilibrium. While having a great respect for the products of the purl knitting machine and some admiration for the special charm of its textures, it may be of interest to indicate how similar effects can be produced on the ordinary plain stitch flat knitting machine provided with the ordinary shogging handle and facilities for producing the royal or tuck stitches. The open effect of the purl stitch is to a certain extent obtained by putting the needles out of work at frequent and regular intervals, and any thinness of texture is obviated by working the pattern in the half cardigan or the full cardigan stitch. The patterns shown herewith are made on a machine having five stitches per inch on the one needle bed, the yarn being white, and composed of strong crossbred wool and worked 4-ply on the machine. In Fig. 1, the following gives the arrangement of needles on the front and back beds respectively.

Back bed—1 needle in action and 1 needle out of action alternately.

Front bed—1 needle in, and 1 needle out for 10 needles; then 1 needle out, 1 needle in and 2 needles out.

This arrangement may be traced on the face of the pattern in Fig. 1, where the one and one arrangement on the front bed is marked A, there being 5 face stitches and 5 appearing on the back bed which corresponds to the first part of the design given. The part B, may be written thus 2 out, 1 in, 2 out, and this may be traced vertically by examining the section marked B. To obtain the particular appearance shown in the design, the shogging handle is brought into action and the general scheme of the shog is: work two courses one to right and another to left and then shog the handle one needle space towards the right, a further two courses of stitches are made when the back bed is shogged one needle space towards the left which is the starting point. If the part marked A', on the right side of the diagram be examined it will be seen that this gives a straight effect to the part marked A, in the vertical direction, but at B^1 the shog appears as a small neat zig-zag owing to the different arrangement of the needles. As two empty needles occur in the needle bed at this point the working of the pattern is thrown off and the zig-zag shows on the face. On looking at the back of the pattern the effect is straight throughout.

If the horizontal part marked B^1 be next examined crosswise, it will be noted that the big section of the design at A, is zig-zagged while the vertical line B, is straight. This is

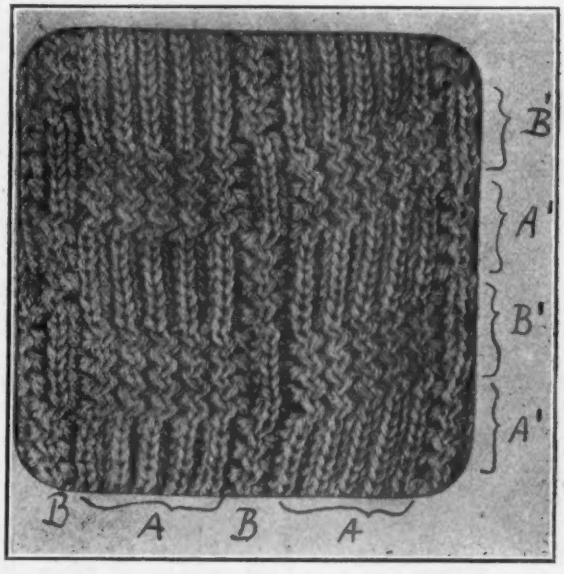


FIG. 1.

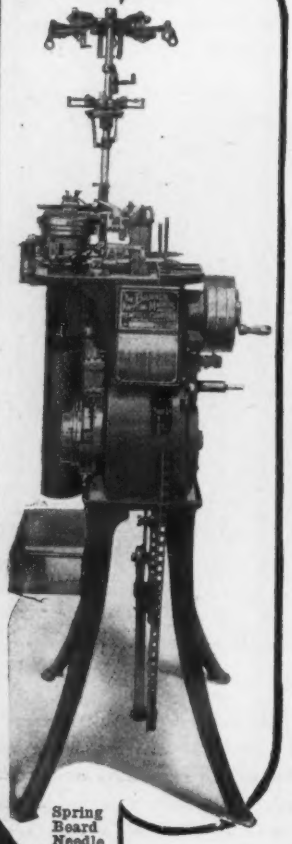
produced by causing the machine to shog or rack two courses to the right in succession after 16 courses, when we rack two needle spaces to the left in succession and work 16 courses at that. Any readers who are interested in the weaving trade will understand this style of design very readily if they recollect the method of making a check effect on the plain cloth. The plain cloth when colored one black, one white warp and weft gives alternate vertical lines of black and white and when two threads of black are brought together at given intervals, the effect is thrown crosswise and the lines appear at right angles. We can obtain the same reversal crosswise by bringing two similar ends of the weave together so that the intersection is thrown on to the opposite set of colors. We may be able to represent this design on paper in a more orthodox manner as follows which may make a more direct appeal to the reader than the longer verbal description just given:

Every alternate needle in the back bed is out of action. On the front bed the needle order is: 1 in, 1 out, 1 in, 1 out, 1 in, 1 out, 1 in, 1 out, 1 in, 2 out, 1 in, 2 out.

The cams of the machine are set to work cardigan eithe.

The Banner

Full Automatic Hosiery Machines



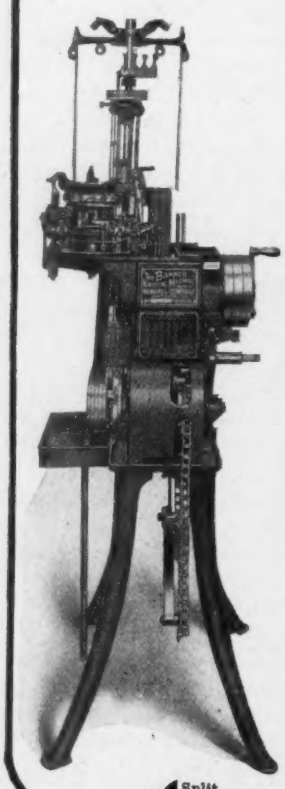
Spring Beard Needle Machine

Simplicity
Quality
Speed
Production

All Parts Accessible from the Front of Machine

We have just placed on the Market two new models– The Spring Beard Needle, built in sizes of 3" to 3 3-4" diameter, and a new model —Split Foot Machine, built in sizes of 3 1-4" and 3 1-2" diameter.

Write for descriptive catalog



Split Foot Machine

HEMPHILL COMPANY

MAIN OFFICE AND FACTORY PAWTUCKET RHODE ISLAND

TRADE MARK

SOUTHERN OFFICE and SHOW ROOMS
912 James Bldg.
CHATTANOOGA, TENN.

PHILADELPHIA OFFICE and SHOW ROOMS
208-9-10 COLONIAL TRUST BLDG.
PHILADELPHIA, PA.

half cardigan or full cardigan. The worker makes the shogging operate as follows. rack 1 to right, 1 to left after every two courses eight times, that is complete in 16 courses, then rack 1 to left, 1 to right after every two courses eight times giving a total of 16 courses in this stretch, or 16—1 right, 1 left and 16—1 left, 1 right.

It is quite clear to the expert that this principle of operation can be widely applied to make a diversity of patterns and various avenues are open to experiment and research. If the shogging arrangement is the same throughout one to right and one to left after every two courses, then it is plain that you would obtain vertical effect entirely, but when you bring the shogs together after every 16 courses, as indicated, a check effect is at once forthcoming.

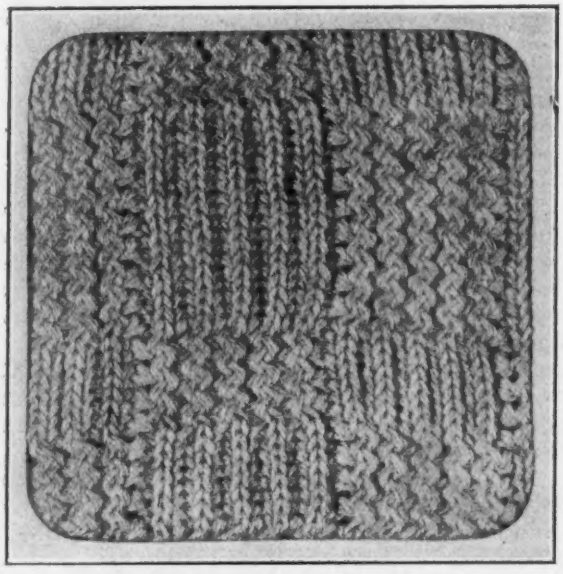


Fig. 2.

To obtain other patterns we should proceed on the following lines to work the experiments on the machine: make needle arrangement in the front bed such that the pattern can be shown a different size in large and small checks, equal and unequal in dimensions. Alter the shog pattern to give different effects in the check as in giving different lengths of style lengthwise. Fig. 2 shows a variation of this style of design where the checks are more even and larger in effect. The back needle bed is once more 1 needle in action, 1 needle out.

The front needle bed is arranged as follows: I needle in, 1 needle out, 1 needle in, 1 needle out, 1 needle in, 1 needle out, 1 needle in, 1 needle out, 1 needle in, 2 needles out, 1 needle in, 1 needle out, 1 needle in, 1 needle out, 1 needle in, 1 needle out, 1 needle in, 1 needle out, 1 needle in, 2 needles out. A closer scrutiny will show that the distance apart of the check portions are equal in length, the 2 needles down at the joint causing the effect to be thrown on to a different set for the next part of the check.

In the cross direction or weft the check is worked as follows: rack 1 to right and 1 to left after every two courses for 16 courses. Then rack 1 to left and 1 to right after every two courses for 36 courses. A similar pattern may also be produced as follows: 20—1 in action and 1 out; then 20—1 out and 1 in on the front bed, back bed one needle in action and 1 needle out. Arrange the machine to give half cardigan stitch and work the racking as follows: rack one to right and one to left after every two courses eight times, then work a single course without racking, after which rack one to right and one to left after every two courses, 18 times, then do a single course without racking. These two single courses referred to are sufficient to throw the pattern off and produce the zig-zag on the alternate set of needles.

Fig 3 is given as a variant on Fig. 1, where the general set out of the needles in back and front bed is the same but there is a difference in the check length, that is the general run of the pattern is in the same rack, this being reversed for four courses only to produce the reversal of the pattern. It is a small alteration in the design but one which is most effective in appearance and giving quite a different aspect to the design. The pattern is changed by working one row or as it is termed "racking on the half course."

All these textures are worked in the half cardigan stitch and the full cardigan may also be employed for certain cases where the weight is insufficient for the requirements. The gauge of the machine is insufficiently filled up and this gives free scope for the pattern to show in its effective-

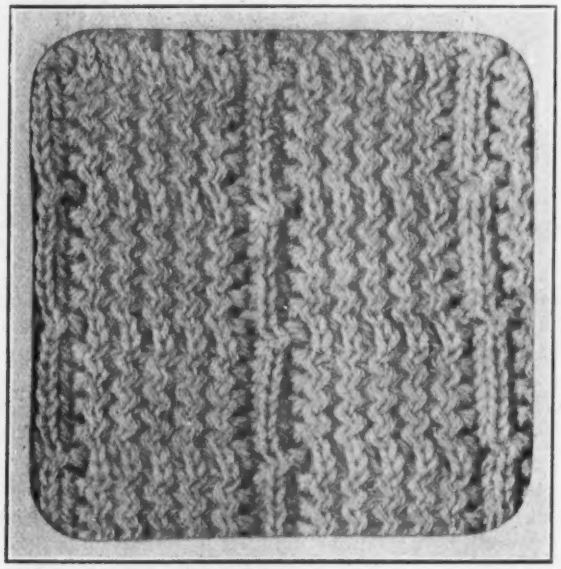


Fig. 3.

ness. The hollow portions cause the design to be displayed in bold relief and these are produced chiefly by the empty needle spaces in the front bed. Fig. 4 gives another basket effect produced in the same lines.

It may now be of some interest to indicate how these patterns may be employed in the garments themselves for it is evident that it will overload most types of articles to have such bold ornamental effects throughout. In the case of knitted dresses, it is often customary to have the lower part of the skirt worked in some plain rib stripe and have the coat to match in some check or basket pattern as described. In some cases this pattern only appears at the shoulder or it may be made on the lower part of the coat. It may also occur that the basket pattern runs right through the garment, but it is essential to exercise caution in stocking such bold designs because their use is strictly limited to individuals of a certain build. One of the out-

standing disadvantages of the checks here described is that they do not suit all wearers alike, they can only be carried effectively by a person of tall stature who is not too stout and portly. These checks tend to accentuate individuals of larger build although they are often quite successful on long thin wearers. From these restrictions it is clear that the scope is not very large and many retailers will prefer to stock designs which are more likely to be in general request from people of all statures. The matter may be compromised in the case of a knitted costume or dress by having the coat in the basket design and the skirt plain

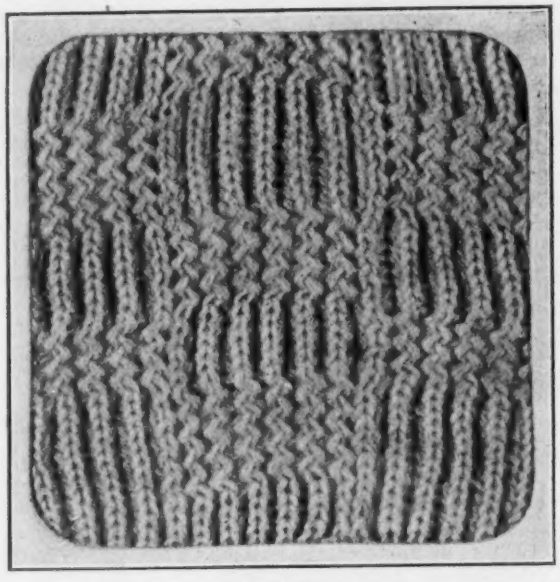


FIG. 4.

or in a vertical rib effect. It might also be effective to have the skirt with the check only a certain length down finishing up with the plain rib effect. It also happens frequently that the basket effect is made for the upper or bust portion while farther down the machine is altered to give quite plain rib stitch; the bust being worked in the half cardigan stitch goes to width and when the stitch is altered to plain rib, discharging its stitches at every course, the fabric immediately contracts and this is very suitable for such portions as the waist.

Similarly in the arm, at present very effective designs are being made by having the arm in some full stitch and for the wrist portion the stitch is altered to some tighter rib, worked in quite a different fancy color, say in artificial silk or mercerized cotton. This tightened effect occurs at the cuff for about two inches or so and the ordinary stitch is then brought into action for a further two inches to finish the sleeve. This gives the effect of drawing the sleeve together at the ends to grip the wearer's arm and also to impart an effect that the drawings have been done purposely for reasons of fashion or style. A similar effect has been produced at the waist where the constricted rib portion is a little longer than the sleeve, say four inches, and this grips the wearer and gives the article a certain feature of its own.

This check style of pattern is very suitable for what are termed house coats which the wearer does not generally wear outside unless under an outer garment to give additional warmth. Indoors however this coat is largely worn when the wearer is performing household duties and it is generally worn rather loose and worked quite short, often coming little lower than the waist. Large numbers of these articles are made at home on the hand knitting pins, instructions for the patterns being obtained from the many domestic journals which issue guides to hand knitting. This style of design is also largely in demand for children's garments which has become quite an important feature of some of our large scale knitting concerns.

Among the Knitting Mills.

The Somers Knitting Co., Stroudsburg, Pa., has perfected plans for the immediate occupancy of its new local plant building, comprising the former works of the Stroudsburg Textile Co. Complete equipment will be installed for the manufacture of knit goods. A dye works will also be established.

The Delta Knitting Mills, Inc., New York, N. Y., has been organized under state laws, to operate a local plant for the manufacture of knit goods. The company is headed by S. Manis, and L. Meyers.

H. W. Anthony, Lebanon, Pa., has plans under way for the construction of a new five-story mill, on local site recently acquired, for the manufacture of hosiery and other knit goods. A list of equipment to be installed will be arranged at an early date. A company will be organized to operate the works, with Mr. Anthony as head.

The Shuttle Knitting Mills, Inc., New York, N. Y., recently organized, with a capital of $10,000, will operate a local mill for the production of a line of knit goods. The company is headed by M. I. Winter, and S. Yudin.

The Lycoming Knitting Co., Dallas, Pa., has acquired a local building and will equip the structure for plant extensions. Immediate occupancy has been arranged, and operations will be inaugurated at an early date.

Officials of the Stanley W. Blum Co., 337 West Adams Street, Chicago, Ill., manufacturer of knit goods, have organized a new company to be known as the Stanley W. Blum Knitting Mills, Inc., to be operated as a subsidiary organization. The new company is headed by Stanley W. Blum, and will maintain corporate offices at Wabansia and Ashland Avenues, Chicago.

The Savory Knitting Mills, New York, have recently been organized under state laws, with a capital of $55,000, to operate a local plant. The company is headed by S. Mantell and I. Stahl.

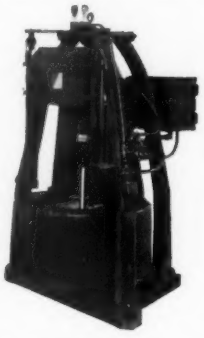
The Arista Knit Wear Mills, Inc., New York, has been formed with a capital of $20,000, to manufacture a general line of knit goods. A local plant will be operated. The company is headed by M. Gross and R. Rosenberg.

The Knitwell Knitting Mills, 230 Fifth Avenue, New York, N. Y., has arranged for an increase in capital to $20,000, for proposed expansion.

The Fashionable Sweater Mills, New York, N. Y., have been organized with a capital of $10,000, to manufacture sweaters and other knit goods. The company will operate a mill in the New York district. It is headed by S. Newmark and E. Gabay.

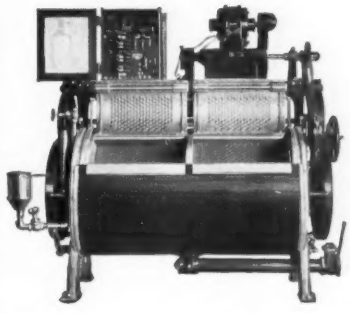
The Allegheny Hosiery Mills, Inc., 1734 North Fifth Street, Philadelphia, Pa., has acquired mill property at Phillipsburg, N. J., comprising a building with about 22,000 sq. ft. of floor space, and adjoining land of approxi-

AMERICAN FINISHING MACHINES *for* KNIT GOODS TRADE



Its safety door is fool-proof

This American "Humatic" Extractor is equipped with a safety device that gives 100 per cent protection to the workman. Once the machine is started the covers cannot be lifted until the machine has been brought to a full stop.

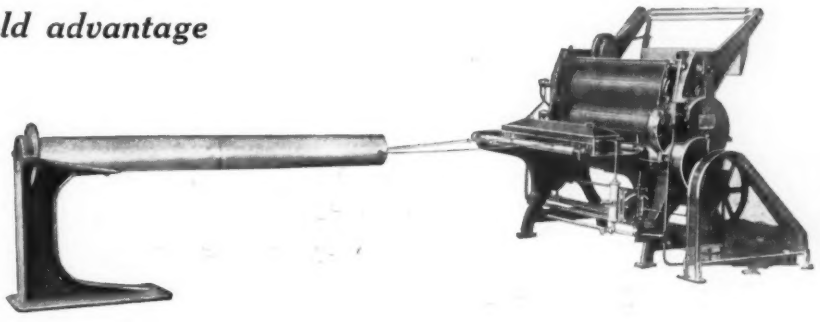


Even distribution of color

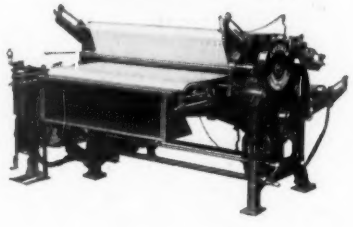
All colors and supplies enter the Monel Metal Dyeing Machine through a patented syphon arrangement. This insures proper and even distribution of the color and other chemicals, and incidentally, more efficient dyeing results.

A machine with a five-fold advantage

Tubular knit goods of uniform width; the stitch set; the stripes on top matching up exactly with those on the bottom, all wrinkles removed, and cutting easier—these are just a few of the advantages an American Knit Fabric Calender will bring you.



Saving $60 a week in wages



That is what some hosiery mills are realizing through the use of the American Rotary Hosiery Press. With this Press four girls can turn out better work, and more of it than eight men using the old method.

A finish that suggests quality

The customer judges the value of your garment by its appearance. Suggest its value to him by supplying a better finish with the American Underwear Finising Press.

THE AMERICAN LAUNDRY MACHINERY CO.

Specialty Dept. C, Norwood Sta., Cincinnati, O.

Canadian Factory:
The Canadian Laundry Mchry. Co., Ltd.,
47-79 Sterling Road,
Toronto, Ontario, Canada.

British Sales Agency:
American Laundry Machinery Co., Ltd.,
36-38 Victoria Street,
London, S. W. 1 England

Send the attached coupon for full information

Fill out and mail the attached coupon today and full information will be sent you by return mail.

The American Laundry Machinery Co.,
Specialty Department C,
Norwood Station, Cincinnati, Ohio.

Please mail me full information covering the "American" Line for Textile Manufacturers.

Signed .....

Business Address .....

City ..... State.....

Uniformity

IN size, in shape, in finish, Excelsior Needles are unvaryingly uniform. They have to be!

Made on machines of extreme precision—gauged at every operation—individually inspected, they *must* be good needles.

Because this uniformity is reflected in more even fabric is perhaps one reason for our supplying practically half of the world's consumption of latch knitting needles.

WITH an annual machine needle capacity of more than 250,000,000 needles of all kinds per year in our different plants, every advantage of quantity production and standardized manufacture accrues to the advantage of our product.

THE TORRINGTON COMPANY

— EXCELSIOR PLANT —

TORRINGTON, CONN.

C. B. BARKER & CO., LTD.
140-144 W. 22nd STREET,
NEW YORK.

MANUFACTURERS SUPPLIES CO.,
CHERRY AND JUNIPER STS.,
PHILADELPHIA.

mately one acre. It is proposed to establish a new mill at once at this location; the structure will be remodeled and necessary equipment installed. At a later date the company will remove its present plant to this location, and will discontinue the Philadelphia mill. Plans are also under consideration for the construction of a new addition to the Phillipsburg plant.

The Fashion Knit Products Corporation, New York, N. Y., has been organized with a capital of $10,000, to operate a local knit goods manufacturing plant. The company is headed by S. W. Worms and I. M. Kastner.

The Chain Knitting Mills, Inc., New York, N. Y., have leased property at 684 Broadway, for the establishment of a local knitting mill.

The Temple Knitting Mills, Inc., New York, N. Y., has been organized under state laws to operate a local plant for the manufacture of a line of knit goods. The company is capitalized at $25,000; and is headed by D. Wolfe, and I. J. Ehrlich.

The Augusta Knitting Corporation, Utica, N. Y., has arranged for an increase in capital from $1,000,000 to $1,500,000, for proposed expansion.

B. J. Priester, of Paducah, Ky., has selected Jackson, Tenn., as the location for a new hosiery mill, and construction work will doubtless begin in the near future.

A hosiery mill is to be located at Tuscaloosa, Ala., by W. B. Davis & Son. A $15,000 brick building is to be erected which will be a one-story, fireproof structure, daylight construction, with all modern conveniences and equipment.

The new four-story knitting mill of the Real Silk Hosiery Mills, Indianapolis, Ind., was formally opened recently. The building is 100 x 190 feet, of mill construction, and will be used in connection with the present two-story building as the main manufacturing unit of the company. A boiler house is nearing completion, which will heat the plant and supply steam for dyeing.

The Princeton (Ky.) Hosiery Mills have recently secured a "Hurricane" automatic singer, and a 300-pound iron rotary circulating dyeing machine, from the Philadelphia Drying Machinery Co.

Contracts have been awarded for miscellaneous work, including plumbing, etc., on the new mill addition of the Holeproof Hosiery Co., at Milwaukee, Wis. This addition is estimated to cost about $70,000.

An automatic silk loop dryer has recently been installed at the Standard Silk Dyeing Co., Paterson, N. J.

A hosiery mill will be erected by the Patterson Hosiery Mills, Princeton, W. Va., recently incorporated with a capital of $75,000. The building will be 50 x 150 feet; two story; brick, steel and glass construction. The average daily capacity will be 300 dozen pairs of stockings. The equipment of the Hetrick Hosiery Mills Company, Walhalla, S. C., with which the new concern was merged, will be installed at the new plant. This consists of 62 knitting machines, dye- and finishing plant and paper box factory with a daily capacity of 3,000 boxes. Machines for silk hosiery will also be installed.

O. L. Benson, C. B. Mathews, and J. E. Shreve, Andalusia, Ala., plan the establishment of a hosiery mill with $60,000 capital.

The Parker Hosiery Mill & Dye Works, Inc., Portsmouth, Va., have plans for the construction of an addition to its plant at Frostburg, Md., to cost about $25,000.

The Knit Goods Market

Some of the low prices for hosiery which were named by a very large mill late in September were increased by the middle of October, after large sales of the relatively lower priced numbers. For example, misses ribbed hosiery made from combed yarn was moved up 10 cents to $1.62½ per dozen, rise and fall 7½ cents, and ladies combed stockings also were advanced 10 cents to $1.77½. The same mill withdrew from sale its mercerized half-hose, packed in half dozen boxes, at $1.82½ a dozen, and also took off sale ladies wide seamed stockings.

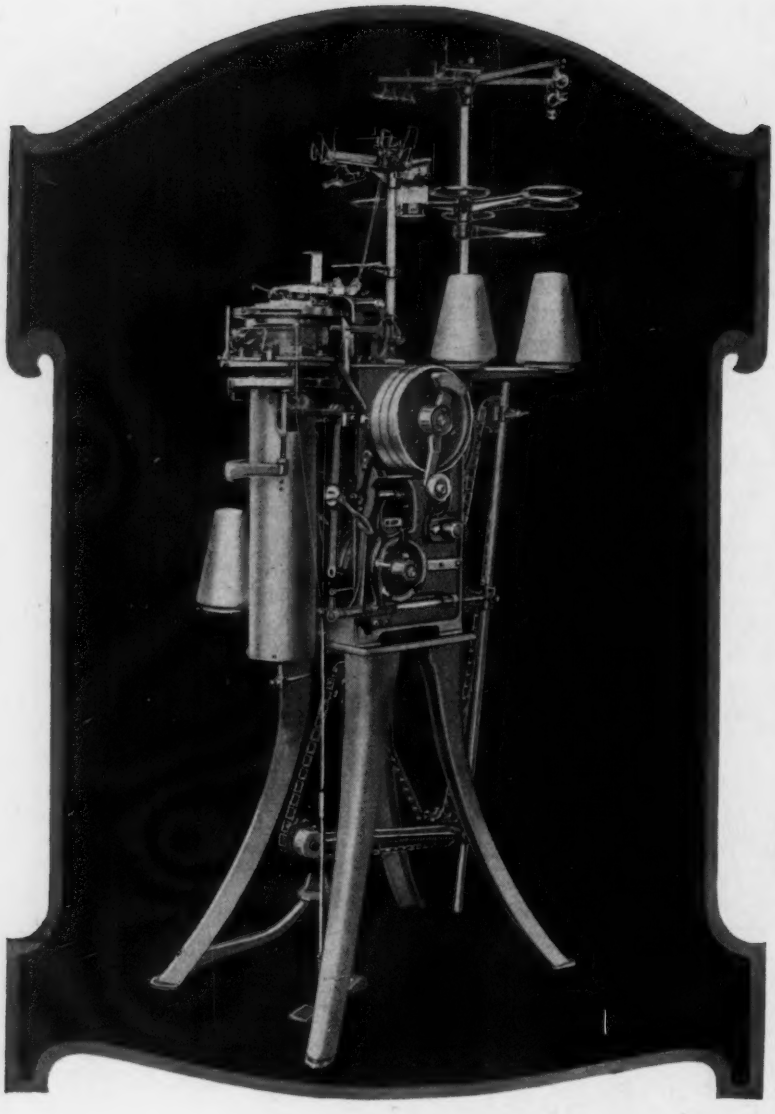
While this mill was selling at prices so low as to startle both manufacturers and jobbers, several of the other large establishments were putting their goods into distribution at the market. This was true especially of combed and carded lines, as well as mercerized, which were bringing approximately 50 cents a dozen more than similar stockings from the mill whose prices had created such a sensation.

Cotton stockings in carded and combed were being taken very freely throughout October, and one mill found an outlet at the market for ladies plain combed, which heretofore were being passed by, jobbers insisting on the seamed. The mill is sold so far ahead of the latter that it no longer could promise desirable deliveries, and rather than wait six to eight weeks for the seamed goods, buyers were glad to get the plain for spot.

One large commission house booked orders aggregating at times from 90,000 to 100,000 dozens of low priced combed carded stockings as a single day's sale, after a long period of supplying jobbers on the light housekeeping basis. When it came to be generally understood that mill accumulations had to a very large extent been absorbed and that spot deliveries were hard to obtain, there developed a keener interest in cotton hosiery for spring, with combed half hose, from several mills having an established trade, also moving freely.

Mercerized hosiery of all classes came into better demand, and cheap lines were especially attractive to jobbers in some quarters. One mill sold up quickly to March of its mercerized socks with combed top, heel and toe. This sock, selling at 25 cents a pair, in a way restored mercerized half hose to a pre-war price basis. In order to successfully compete with combed half hose at a quarter it became necessary to cheapen the mercerized, and that seems to have been done successfully without detracting from the durability of the stocking or the appearance of that part of the leg usually exposed.

Infants socks have given manufacturers no end of trouble. Some mills deferred their opening until others had gone in the market, and before selling was well under way for next spring price reductions were announced. The result was, buyers became distrustful, and many who had come to market to make their commitments returned without having done so, much disturbed over price instability.



WILDMAN
THE WORLD'S STANDARD

Wildman Spring Needle Knitter

Are you considering the purchase of hosiery knitting machines?

The name "Wildman" represents conscientious effort of over a generation devoted entirely to building and improving high grade knitting machinery.

Wildman Knitters will make the high spliced heel, reinforced heel and toe, ring toe and double sole with entire satisfaction.

They are meeting a nation-wide demand.

We are now able to sell Wildman Spring Needle Knitters in all foreign countries.

On request we will send the "Wildman Spring Needle Knitter Machine Instruction Book" giving detailed information and description of every important part of the machine.

We have issued a very complete and informative book, "The Science of Knitting." Price $3.00

TRADE MFG MARK

WILDMAN MFG. CO.

NORRISTOWN, PA.

It is stated, and commonly believed, that a few mills are quoting prices under actual cost, and glad to get business at that, with jobbers merely dabbling. When prices were named last year for 1922 a mill paid $1.11 for mercerized yarn bleached. A recent quotation from the same spinner and mercerizer was $1.07½. While the decline in the price of the yarn from which the socks are made is but 3½ cents a pound, the socks are priced 35 cents a dozen lower than last year. The deduction must be that if manufacturers are breaking even at today's prices they must have had enormous profits a year ago, for in a general way there has been no reduction in operating costs except through greater efficiency and possibly slightly diminished over-head. One mill is understood to have reduced wages by 15 per cent prior to naming this year's prices, and it is stated this mill now is advertising for help.

Socks are cheap because too many of them are made In 1920 they were scarce and mills were getting a profit. Being scarce, jobbers bought heavily for 1921, and meanwhile additional mills were established and others augmented their equipment, so that by the end of the selling season more socks had been put in distribution than jobbers seemed to have been able to move in 1921. They had carry-over stocks when the present season opened, and as prices for a time were being marked down by mills, buyers found good excuse for declining to operate in a substantial way. Recently, after prices appeared to have become stabilized at a losing level, there was some revival in buying and manufacturers now feel more encouraged.

The big problem in hosiery relates to goods of all-wool and wool and silk in combination. No one seems to know whether wool hosiery will be popular for the coming winter, and necessarily there has been much uneasiness among both manufacturers and jobbers having large holdings. Taking one mill for illustration, at the beginning of October it had in its warehouse $50,000 worth of silk and wool hosiery for ladies, priced at $12.50 to $16.50 a dozen. A part of this accumulation was due to cancellation by jobbers. What to do with it was the question which the owners of the mill, for some time idle, had to dispose of. The season was growing late for distribution through jobbers, on whom little dependence was being placed, and arrangement was made for sending the goods direct to retailers in several of the larger Eastern cities.

In many quarters the impression is growing that ladies silk and wool hosiery at $2.00 to $3.00 a pair will prove a strong seller, and holders of this class of goods, it is believed, will find they were unnecessarily alarmed.

Two well known jobbers having large stocks of silk and wool hosiery intimated very plainly early in the month that if the goods did not prove attractive to retailers very soon they would "put the knife into them." Some interests believe that these threats to sacrifice the goods were made with a view of causing disturbance among mills generally and diverting interest to silk hosiery, of which also some jobbers have cumbersome stocks, as is shown in some of the prices which are heard.

The lowest price at which any mill is offering standard tram silk boot full fashioned stockings for next year is $13.50, yet a jobber is quoting $15.00. It must be obvious that this jobber would not, under normal conditions, be willing to operate on a margin of 10 per cent, and it may be assumed he either is overloaded with silks or has a suspicion that wool hosiery will be worn extensively. The same jobber offers ladies 20 inch boot seamless silks at $9.50, which also is a ridiculously low price for a 12 strand stocking of the class.

Both full fashioned and seamless silk hosiery mills, as a class. found it expedient for some weeks to slow down on operations. It became a question whether there had been over-production or the trade was looking for under-consumption, and the situation was made the more discouraging by the dumping of nearly all classes of silks by some jobbers at and even under mill prices. During this confusion, however, the Berkshire Knitting Mills opened its line for spring 1923 at the prices prevailing for the current and the preceding season, and it is stated by persons in a position to know the facts that the mill by the middle of October had sold more than two thirds of its production for the first half of 1923.

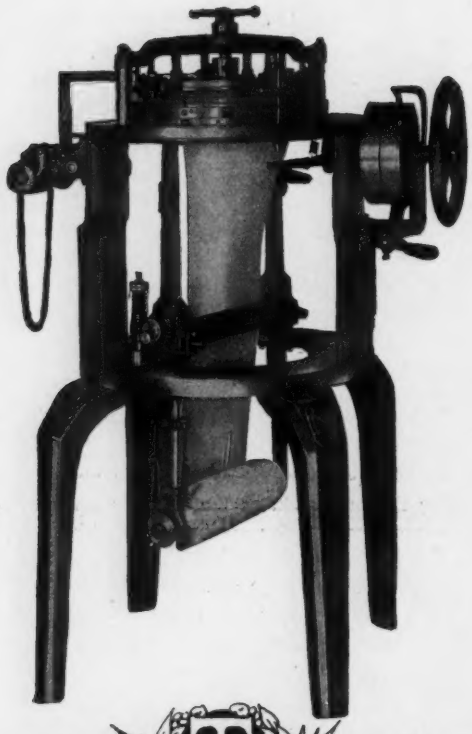
Seamless hosiery made on spring needle machines has been leading the procession of the seamless classes. The trade pays more money for spring needle silk stockings than for the product of many mills using latch needles, this being true especially of ladies hosiery. A number of mills making spring needle silk goods have been unable to supply demand, and several have added or will add more machines. Eventually, of course, the market will be over-supplied with spring needle hosiery to about the extent it has been deluged with nearly every other class.

Since full-fashioned lines have been opened for next year, they are receiving somewhat better attention, which may be attributed to the fact that prices are as low, and in some instances lower, than a few months ago, notwithstanding raw silk has advanced approximately 30 per cent since September, in a somewhat stagnant market.

The Cannon Mills, selling the product of the Wiscassett Mills Company, Albemarle, N. C., also will distribute the company's full-fashioned silk hosiery for ladies, the manufacture of which is expected to begin about January 1st. The full-fashioned equipment will comprise eight machines brought from Germany and but recently arrived.

While distributors are buying much more freely of most classes of hosiery than a month ago, it is believed they are missing an opportunity in not contracting farther ahead, as it is doubted whether existing prices can remain at the present level, being forced up by not only higher cost of raw material, but by increases in wages as well. Only a few weeks ago a Philadelphia hosiery mill announced a voluntary increase of 10 per cent after dissatisfaction among the operatives had become marked. While adding to the cost of its product, the mill stated in a letter to the employees that one of its numbers in particular was being put into stock notwithstanding the price on it showed no profit. The mill, in explanation of the advance, stated, "We recognize that living costs are high and are made higher by certain classes who, by appropriating more than a fair share of the profits of normal business, make rents much more costly than they should be."

Skilled help is not plentiful in Philadelphia, which accounts for increase in pay. On the other hand, certain classes of hosiery have been so plentiful that prices have been known to diminish while wage and other costs were increasing. It seems that the only way out of the anomalous situation is to turn attention to lines in which there is not nor is there likely to be very soon a surplus. In



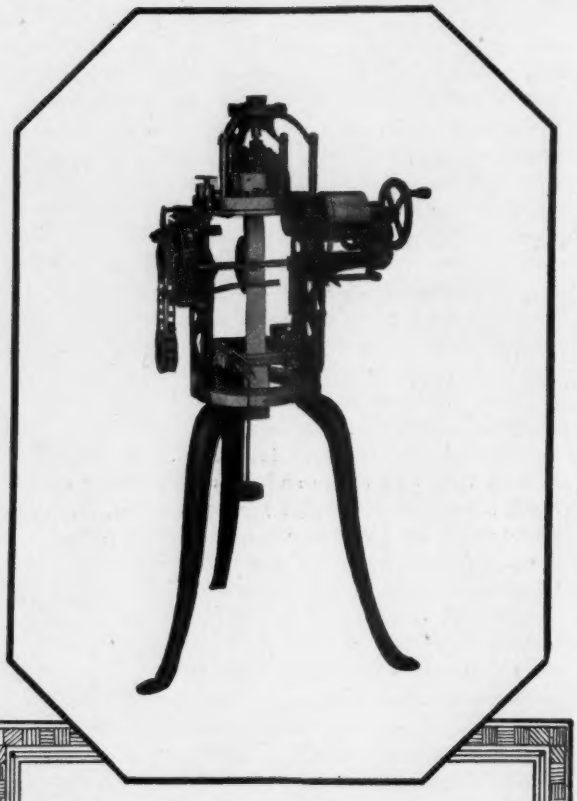
REPUTATION

COUNTS in business as in everyday life. Our business career spans nearly half a century, and in that time we have established a reputation for fair-dealing and the building of dependable, durable machines for manufacturers of circular ribbed fabrics of all descriptions.

We claim for our machines simplicity, correct principles of construction, durability and excellence of workmanship.

Reputation—with half a century's time back of it.

TRUMP BROS. MACHINE COMPANY
SUCCESSORS TO
NYE & TREDICK CO.
BEECH AND ANCHORAGE STS.
WILMINGTON, DEL. USA.



BRINTON RIBBERS

possess all modern improvements, including selvage welt, French welt, double knee dogless and striping attachments, with automatic stop motions.

Built in all sizes, for all classes of rib work.

We also build hosiery knitters and Body machines for underwear and various other circular machines for all kinds of knitted articles.

Samples and prices on request.

H. BRINTON COMPANY
Kensington Ave. & "M" Street
Philadelphia Pennsylvania

other words, the production of novelties is a partial solution for manufacturers with the capital and the know-how for bringing them out.

More than one jobber has said his house is through with novelties; that it never again will dabble in the "millinery" business. Wholesalers will handle novelties in the future and will be as glad to get them as they were in the past, when they were the life of a trade—what salt is to potatoes. If jobbers do not deal in them, still more business will go to mills selling to retailers direct.

Retailers, as a class, are "in bad" with a large part of the public, in the opinion of the president of a leading Philadelphia Bank. By undertaking to do business with poorly assorted stocks and holding out for exorbitant prices, the banker says, they have added to the difficulties of shopping. It will take them some time to reinstate themselves in the favor with which they formerly were held by the public, the banker said, and he predicted that the attitude of both jobber and retailer toward staple merchandise was inviting the establishing of chains of stores for selling hosiery and underwear in conjunction with shoes. In fact, it was stated, there already is being operated thirteen hosiery specialty stores under one management, one of these being in Reading and another in Bethlehem, Pa.

Although the retailer is being much complained against, as is the jobber, for ultra-conservatism, it is noted that the trade is prompt to take hold of fetching lines of hosiery as they are brought out, and get a run of them before they can be introduced in stores generally. In this class of goods may be mentioned the low end heather stockings of the Burson Knitting Company and ladies hosiery of tram and artificial silk in combination from the B Z B Knitting Company at Rockford, Ill. This latter mill is showing the line in plain and mixed colors, of which there are more than thirty to select from, and it is stated that if these are not enough the mill is prepared to produce any other shades that may strike a dealer's fancy. The sale of this one line, in the striped ribbed designs, support the proposal that the trade still is quickly responsive to novelties. It seems not unlikely, however, that future innovations will follow more conservative lines than did many of the creations of the last few years. Novelties are yielding a profit while some of the staples are being neglected simply on the price issue.

There is some buying of hosiery for spring, but operations are too much restricted, when is taken into consideration the prices obtaining. Inquiry is very common, showing that distributors are getting closer to the hosiery market, but it is difficult for mills to quote except for immediate sales, as it is found that as often as inquiries are received notices of increasing prices in cotton yarn come through.

It is stated in the Philadelphia yarn trade that southern hosiery manufacturers are buying vastly more cotton yarn than are those in the north, particularly of coarse carded counts. Some of the southern mills, according to manufacturers in Philadelphia and nearby territory, are supplying hosiery to the latter at prices which enable them to sell the goods profitably to jobbers at less than would be the cost in their own mills. This was strikingly illustrated recently in relation to a line of carded half-hose in heather effect.

One of the more interesting showings in the 1919 census statistics is that in relation to the production of cotton hosiery which, making comparisons with 1914, fell off 1.3 per cent. During the same five year period the production of men's and women's all silk and silk mixed hosiery increased 97 per cent. The current five year period will show another increase, much of the gain being in full-fashioned goods. The 1919 census shows that for the year under inquiry the production of all classes of hosiery in the United States was 1,015,749,084 pairs, or 84,645,757 dozens, of a mill value of $713,139,689, comparing with 75,164,911 dozen pairs, mill value $258,912,903, in 1914.

One encouraging phase of the hosiery market is the increasing volume of business being offered for export, but it is noted that since American jobbers put up a stiff fight for terms of 2 per cent.—10 days, 60 days extra, buyers in foreign markets have been encouraged to ask for concessions. Whereas it has been customary to bill goods for export payable on delivery to shipping companies, buyers now are asking for sight draft attached to bill of lading deliverable in the port of destination. Bankers and attorneys who have intimate knowledge of the troubles which have fallen to shippers not receiving payment before the departure of their goods from domestic ports, counsel against any arrangement providing for payment on arrival of the merchandise at the port of destination. So much time intervenes between the shipping and the receipt of the goods and so many things may happen in that time that, if the happenings are against the interests of the consignee, he is in position to exact compromise terms from the consignor before taking the goods out of bond. It is pointed out that, regardless of how good a foreign buyer's credit rating, the hazard is greater than in selling for domestic account where the rating is equally good.

Underwear manufacturers have had a somewhat perplexing ten months. At no time during the year was the trade buying commensurately with the winter's needs. In fact, some few jobbers did not place their initial orders until the early part of October. It was only the smaller houses that stayed out of the market, most of the larger establishments having bought 25 to 30 per cent of the requirements during the period immediately following the opening. Prices actually were on the basis of cotton 12 to 14 cents and these prices were being resisted by jobbers when cotton was commanding 22.

"Cotton underwear is the cheapest thing on the market," said a buyer for one of the larger western houses recently. He admitted, however, that his house was not taking advantage of the low prices, and he expressed a fear that later in the year there might develop a tight situation. True to his prediction, buyers have been rushing the market for immediate delivery of winter weights and frequently have not been able to get the deliveries desired.

The trade seem to feel that as mills were operating at capacity they must be accumulating stocks, and that goods would be obtainable whenever wanted. This proves to be not the case. While latterly mills have been pushing out goods as fast as they could be gotten off, they got started so late in the year, because of the tardiness of jobbers to operate, that they were left with about nine months in which to get off twelve months production. Thus there are no such accumulations as jobbers hoped they might depend upon for late goods.

Repeat orders increased in numbers as the weather became cooler, and successive orders showed little or no diminution in quantity, all of which is taken to mean that re-

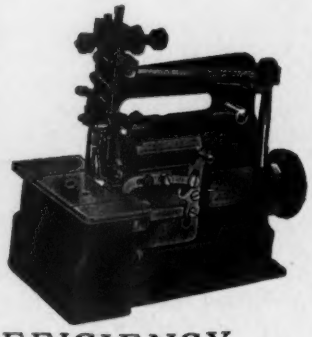
MERROWING

ESTABLISHED 1838

Makers of

MERROW
Reg. Trade Mark

The Merrow High Speed Overseaming Overedging and Shell Stitch Machines.

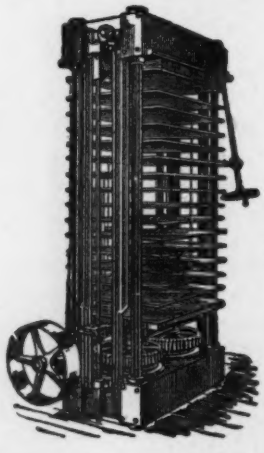


MERROWISE FOR EFFICIENCY IT MEANS

MAXIMUM PRODUCTION
MINIMUM EXPENSE
UNEXCELLED QUALITY OF WORK

THE MERROW MACHINE COMPANY

16 LAUREL ST., HARTFORD, CONN., U. S. A.



RELIANCE
Hot Plate Screw Press
FOR
Hosiery and Underwear
Write for Catalog and Prices
Reliance Machine Works
FRANKFORD, PHILA.

JOSEPH T. PEARSON & SONS CO.
MANUFACTURERS OF
BONE DRY
HOSIERY FINISHING BOARDS
THAT WORK ABSOLUTELY SMOOTH
PROMPT SERVICE—RIGHT PRICES
1815 E. Boston Avenue, Philadelphia

GENERAL MACHINE WORKS
YORK, PA.
Manufacturers of
Circular Rib Knitting Machinery
Cylinders and Dials

tailers are pressing jobbers for goods. The jobbers have been complaining that they were withholding their committments because they were not hearing from the retail trade, and this probably is no misrepresentation, for the retailers are known to have been merciless in withholding their orders from the jobbers, leaving the latter with the only alternative of carrying stocks for them, unless mills could be persuaded to put goods in stock for the jobbers. This, the mills seem to have been unwilling to do, and now there is not as much underwear in stock anywhere as the trade will require for going through the winter. There will be no shortage, of course, as mills will continue to make up the garments for orders as they come along, whether they are for large or only small quantities, but the difficulty will lie in getting the goods into distribution in time to assure distributors what should be a year's normal business.

Several of the southern mills which started the selling seasons with excruciatingly low prices and refrained from revising them, have sold or will sell approximately 75 to 80 per cent of the average year's output. One of these mills in particular is having a phenomenal run on cotton ribbed shirts and drawers, while earlier in the year demand was confined almost exclusively to union suits. It seems the trade overestimated the number of shirts and drawers to be disposed of by the government as war left-overs. These have been dumped in less quantity than was anticipated and there now is a freer market for the separate garments. A manufacturer attributes the greater demand to the fact that the men in the military service during the war were required to wear the shirts and drawers, and, he believes, having become accustomed to them, they now prefer them for civilian use.

A number of dealers have been trying to buy seconds of cotton ribbed 16 pound union suits, for meeting the objection to paying $1.50 per garment for firsts. This is the price at which they are assumed to sell in retail stores, costing jobbers around $10.50 a dozen. It was thought there would be a big outlet for seconds priced $1.25 per suit, but it is understood that good seconds at $9.00 a dozen were not to be obtained, and it is believed that those which were picked up will go over the counter at the price of firsts when, late in the season, underwear becomes scarce in stores which neglected to buy at a time when mills were in position to make almost any delivery desired.

Following advances in prices of heavyweight underwear by several mills, the Utica Knitting Company recently moved its figures up slightly while delivery rather than price was the issue. This may be taken as forecasting further advances when mills are being subjected to extraordinary pressure for shipment.

Wool underwear prices were advanced by several mills selling through a large commission house after conferences with a number of leading buyers. Mills wanted $1.50 more for one type of garment; buyers were willing to concede them only $1.00, and that is the figure on which they compromised. On all other proposed advances, running as high as $5.00 a dozen, seller and buyer split 50-50.

Fleeced underwear still is offered at the prices named at the opening, notwithstanding a very material increase in manufacturers' costs. For example, a 17 pound fleeced union suit is costing a manufacturer 68 cents more for yarn alone. The price was marked up 50 cents a dozen, but jobbers have refused to pay it, except for special packing, rather inclining to smaller quantity of mill packing for quick delivery. The Highrock Knitting Company has made no change in its prices, following its former policy of adhering throughout the season to the schedule named for the opening.

Lightweight underwear is a between-seasons proposition at the moment, and buying necessarily is in small volume. Repeat orders are not likely to come through in any great volume from jobbers until after they have canvassed the retail trade. Salesmen now are on the road and it should be but a short time before jobbers come along with duplicate orders.

Some of the interior Pennsylvania mills have but fairly started for spring, resuming operations after a shut-down since July 1st. These mills carried considerable stocks over from last season and these were sufficient to hold price advances in check. It is a common belief that future orders for light-weight underwear will be priced 25 to 50 cents a dozen higher than for goods bought several months ago. A few mills already have marked up their bal briggans by 12½ to 25 cents a dozen, and one of the larger factories is sold up until late next spring. Announcement is made that if further orders can be taken care of they will be subject to an advance of 25 cents a dozen for men's bal shirts and drawers.

Taken as a whole, the situation in the underwear mills, both in heavy and light weight lines, is better than for sometime, and it looks as though manufacturers will be kept fairly well engaged for the remainder of the season and that the better returns will come from their late production.

The Yarn Market.

After dropping rapidly from a fairly high level to approximately a new low basis, cotton yarn rates on the Philadelphia market experienced a recovery during the first week in October and were continuing on their upward trend at the time of this writing.

On September 25th, 46½ cents was the price asked for 30s carded hosiery yarn on cones. October 2nd saw this price down to 44 cents bid, while another four days brought them down to 42 and 43 cents. On October 6th or 7th, however, an unexpected recovery in prices was effected, and on October 13th these yarns had regained somewhat to a price of 44 cents asked.

This recovery was apparent in all sections of the list, and various factors attributed it to various causes. Some said the firmer prices of cotton resulting from the government report on the first had something to do with it; others pointed out that the spinners had again determined, and had put their determination into action, that they could no longer sacrifice yarns to the advantage of the buyer and the loss of their own finances. Other factors placed the cause for this sudden rise in the fact that local stocks of standard counts were exhausted or becoming so. Another cause to which the rise was attributed was a better demand on the part of consumers.

And it was true that simultaneously with the rate increase, there came a much better demand for yarns of practically all kinds. Weaving yarns held the forefront as to volume of business with yarns for knitting purposes running them a close and gaining second.

ABERFOYLE MANUFACTURING COMPANY

MERCERIZED YARNS

MAIN OFFICE
EMPIRE BUILDING
PHILADELPHIA

ADAMS-FRANKLIN BUILDING
CHICAGO

MILLS
CHESTER, PA.

WESTAWAY BUILDING
HAMILTON, CANADA

DIXIE MERCERIZING CO. — DIXIE — STRENGTH — QUALITY — LUSTRE — CHATTANOOGA, TENN.

Mercerized Yarns

C. P. Mercerized Cones & Skeins

20/2-80/2 Natural and Gassed

DIXIE MERCERIZING CO.

CHATTANOOGA, TENN.

REPRESENTATIVES: Philadelphia Pa., Cameron & Pfingst—Reading, Pa., Cameron & Pfingst—Chicago, Ill., Kentucky Textile Products Co.—Louisville, Ky., Kentucky Textile Products Co.—Canada, Slater & Co., Toronto.

"Royal-Chicago"
PRODUCTS

STANDARDIZED INDUSTRIAL SEATING

Seating the worker so that each can produce more efficiently need not mean a variety of special chairs or stools. . . . . The posture requirements of the individual worker may be met by *standardizing* on one type of seating.

This type, if adjustable to height and with an adjustable back-rest, enables the seating to be shifted to different operations and be equally adapted to workers at each.

It reduces both expense and purchasing effort.

FS-14 Patented Adjustable

ROYAL METAL MFG. COMPANY

Builders of Correct Industrial Seating

2325-29 S. Western Ave.

CHICAGO, ILLINOIS.

FS-15 Patented Adjustable

The entire feeling in the market has been changed by this sudden influx of good business, and also in view of the fact that higher rates have come along with it. In the activity which has been going on in the market in October, it has developed that there are quite a number of "bare spots" in the stocks of current yarns on hand in the warehouses of local dealers, and it was pointed out that now business is coming in quite a number have regretted the early disposition of yarns accumulated during the summer.

At the moment it appears that with the new and better conditions, the market will soon adjust itself upon a well defined and healthy basis. It was asserted that the increased demand was due in a number of instances to much better business conditions in consumer industries, and with this as a fact and conditions in the local market improving, the next few months should see considerable activity in yarns.

Following are quotations on the Philadelphia market for October 13:

Single Skeins.

4s to 8s	35½	20s	39 @39½
10s	36	24s	41½
12s	37	26s	42 @43
14s	37½	30s	46 @47
16s	38		

Single Warps.

8s	35	20s	40 @41
10s	36	26s	44 @45
12s	37	30s	47 @48
14s	37½ @38	40s	58 @59
16s	38½ @39		

Carpet and Upholstery Yarn in Skeins.

8s and 9s 3-4 slacks	36½
8s 3-4 tinged tubes	35 @35½
8-3-4 hard white warp-twist	36
8-3-4 hard twist waste	33 @35

Two-Ply Skeins.

8s	36	20s	40
10s	36½	24s	42 @43
12s	37	26s	44 @45
14s	38	30s	47 @48
16s	39	40s	58 @59

Two-Ply Warps.

8s	36½	20s	41 @42
10s	37	24s	44
12s	38 @38½	26s	45
14s	38½ @39	30s	49 @50
16s	39 @40	40s	60 @61

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	60 @52	50s	80 @85
20s	52½	60s	90 @95
24s	57	70s	$1.00@$1.05
30s	60 @62½	80s	$1.15
40s	70 @75		

Frame Spun Carded Yarn on Cones.

8s	35	22s	39 @40
10s	35½	24s	40 @41
12s	36	26s	41 @42
14s	36½	30s	43 @44
16s	37	40s	57 @58
18s	38	30s double carded	46
20s	39	30s tying-in	42

Mule Spun Carded Yarn.

10s	38	20s	43
12s	39	24s	44 @45
14s	40	26s	46 @47
16s	41	30s	49 @50
18s	42	40s	59 @61

Mule Spun Combed Peeler Yarn on Cones.

10s	49	26s	62
12s	50	28s	66
14s	51	30s	68
16s	53	36s	78
18s	54	38s	79
20s	56	40s	83
22s	58		

The Wm. H. Rankin Company, 180 North Wabash Avenue, Chicago, Ill., has compiled a business analysis of the United States which should be especially timely and interesting at this time. This report is made on each county in every state in the country, giving the respective farm value, crop value, income tax, population, manufacturing value, total mileage of all roads and the total of surfaced road in each county. A summary for each state includes this information for the respective state, giving also important figures concerning the climate. The data consists of two volumes, each bound in a flexible leather binder containing loose leaves which can be replaced.

Open Price Custom May Be Revived.

A recommendation by certain Cabinet members that a governmental agency be created with power to advise and supervise commercial organizations such as "open price" associations has aroused considerable interest in trade association circles, particularly among those who discarded "open price" when the United States Supreme Court ruled against the American Hardwood Lumber Association.

The suggestion of the Cabinet members has the approval of Attorney General Daugherty who is of the opinion that the projected agency might issue some sort of Federal permit to associations whose plans of operation had been examined and approved.

John Nash McCullaugh, national secretary and industrial manager of the National Association of Hosiery & Underwear Manufacturers, who is an ardent champion of "open price" legitimately practiced, believes that "open price" is the most enlightened vehicle that has ever been used in commercial life in this country.

"There is no doubt," claims Mr. McCullaugh, in a recent interview in the *New York Times*, "that the decision in the American Hardwood case spells disaster for all those associations who have paraded under the name of 'open price' with fraudulent intentions.

"However, any association that is operating an 'open price' plan of information, based upon past sales or quotations, and that in no way discusses with its members, either at meetings or by printed matter, the advisability or inadvisability of changes in price, cannot be classified with the American Hardwood Lumber Association.

"The lawmakers of this country have always endeavored to make the manufacturers live in darkness," he continued. "They have permitted labor unions to combine and form organizations far more potent and powerful than our biggest trusts; they have permitted the formation of farmers' associations and cooperative organizations to control production of the soil, and to combine in the marketing of their produces; but any time that the manufacturers have tried to find the light of day, our legal sycophants and parasites located in Washington immediately cry 'Wolf' and proceed to destroy that which will enlighten the greatest and most progressive brains in this country. Statistics show that the manufacturing industries of America are 78 per cent efficient, that the railroads are 64 per cent efficient and the farmers are 48 per cent efficient.

"Try as they will, the lawmakers at Washington will not be able to stop honest open price method of exchange of sales information, because it is enlightening to the most efficient and productive body in America.

"The man who says that competition as waged in the days of piracy, and by the rule of thumb, is the life of trade, is a fool. Enlightened competition is the only form of competition that can bring success to our industries.

"To say that open price information, based upon past sales and quotations is against the laws of the country, means, if carried to the broadest point of the law, that the stock and commodity exchanges of the country must stop publishing their salesprices at the end of each day. Along the same line the department stores must stop publishing their prices and the railroads likewise.

"This country is facing a year which I believe will be far more trying than the past two have been, irrespective of the

latter-day prophets who predict glorious prosperity, and who sit back calmly in their rolling chairs while they wait for that prosperity to fall into their laps. Men of this type remind me of the man who has a sign on his desk, "Time is Money," and who, when interviewed, takes three quarters of an hour to tell you why he has Guernsey cows on his farm rather than Jerseys.

"It is a known fact that the banks are carrying many manufacturers that have been unable to come through the period of readjustment satisfactorily, and that these will shortly fall by the wayside. More brilliant examples of unintelligent, piratical competition.

"After the manufacturers have thoroughly revised conditions in their own factories and put their methods back to pre-war standards, and once again made salesmen out of the present-day 'order-takers,' industry must look to trade associations for three forms of enlightenment.

"The first is, uniform methods of cost finding. If men in a given industry will compile their costs alike and by the same method, whether from the technical viewpoint the costs are right or wrong, competition will be placed on a more intelligent basis.

"The second is, intelligent production reports, as a guide to the manufacturer of what is happening in the industry as a whole, and in order that he may not follow the path of some unwise competitor by reason of propinquity.

"The unenlightened manufacturer is in a position of serious disadvantage. He seldom meets the men who keep track of what is going on and he often clings to methods that are actually out of date, or that are about to be superseded by improved processes. He is at the mercy of all his competitors who are better informed.

"The third, and the most important, is the open price method of exchange, when honestly operated, based upon past performance and without any attempt whatsoever to fix prices.

"It is impossible to keep men to a fixed price, therefore, why waste time in trying to do it? It is possible, however, to keep them to an agreement to tell others what they have done. Note the distinction. The fixed price means an agreement or scheme to maintain a price or live up to something. That sort of an agreement is never kept for long. Quite aside from the question of legality, the agreement is worthless, because it is no stronger than each man's belief in the good faith of each party to it; and since each man feels sure that some of his competitors will be quick to drop it and reap a profit, he secretly ceases to follow it himself.

"The agreement to tell one another what has been done is quite another matter, since after all it simply provides for a systematic exchange of information that is sure to come out. This is so fair and works out so many good results that the trickiest competitor in the end sees it is to his advantage to live up to it.

"There is not a manufacturer in the country today, if he is astute and alive to his opportunity, that cannot procure within 48 hours any article and the price on this article. Why, then, make the manufacturer resort to surreptitious methods that savor of stealth and dishonesty, when the same information can be exchanged through an association office?

"The result in associations where open price policy has been followed have been greater stability to prices at normal levels, without arbitrarily attempting to control prices; the elimination of secret rebates and discounts treating all customers fairly and on a footing of equality; and the uplifting of the entire industry to a higher level. (And uplift is something that most industries in America can use.)

"Successful manufacturing can only be carried on by the medium of cooperation. The family is a cooperative unit, Cain and Abel competed over their offerings and their rivalry resulted in murder. Not until the 13 colonies were willing to sink (in a large measure) their jealousies and cooperate, was it possible to form this republic. And there is nothing in the Constitution of the United States that says that business men must be brigands and resort to piratical methods in order to satisfy the Government. The open price method of exchange is the only method for stabilizing industry that has ever been presented to the manufacturer. It benefits both the retailer and the consumer as much as it does the manufacturer, by reason of a stabilized market condition. And at this late day and date the manufacturer is not going to be deprived of the first intelligent tool that has been placed in his hands. Therefore, I say irrespective of Washington, open price is here to stay, in one form or another."

An interesting booklet discussing the value of proper illumination in industrial plants has been issued by The Skybrite Company, Cleveland, Ohio, under the title "Daylight, the Natural Illuminant." It contains 48 well prepared pages of text matter and illustrations, and, giving the history of daylight in an entertaining manner, the book advances reasons for daylight as the natural illuminant. It points out that the spectral character of daylight is that for which the eyes have become best fitted, and continues, "The atmosphere tempers its quality by filtering out the harmful radiations. The light scattered by the atmosphere provides the well diffused light of the sky—a source which sends light into our interiors. Daylight is the standard for discriminating colors. It provides intensities of illumination incomparably greater than those which at present we can afford to obtain by artificial means. Adequate illumination of the proper quantity and diffusion has been found to decrease accidents and spoilage, to increase production and stimulate the workman and to make him more cheerful. Daylight also has the ability to further safeguard the health of the worker by preying upon germs."

However, it is pointed out, the chief handicap of natural light is imposed through neglect in providing or in maintaining adequate glass areas for the making of its great intensities available indoors, and the book discusses this feature of providing adequate and proper lighting. Copies may doubtless be secured upon request.

The Hemphill Company have appointed Herbert E. Gosling as their southern branch office manager, to take charge of the Chattanooga office beginning October 1, 1922. Mr. Gosling has been with the Hemphill Company practically from the time the "Banner" machine was placed on the market, and is thoroughly acquainted with the manufacture of hosiery and all its branches. The Chattanooga office is located at Rooms 912-913 in the James Building.

Roessler & Hasslacher Chemical Co., 709 Sixth Ave., New York, have appointed Samuel C. Harris as resident representative for the southern states. Mr. Harris will make his headquarters at 403 Clement Ave., Charlotte, N. C.

SANDOZ

ANILINE DYES FOR ALL TRADES

We carry a complete line at all Branches

For samples and prices apply at any of our offices.

SANDOZ CHEMICAL WORKS
INCORPORATED

238-240 Water St. NEW YORK
12 So. Front St. PHILADELPHIA
175 Market St. PATERSON
36 Purchase St. BOSTON
Commercial Bank Bldg. CHARLOTTE, N. C.

The Walke Box Company, Inc.

NORFOLK, VA.

Manufacturers of

NORTH CAROLINA PINE BOX SHOOKS

Bradley Stencil Machine

The Bradley Stencil Machine makes Stencils in half a minute at reduced cost of 1-10c each. Write for catalogue and price list.

In universal use by thousands of manufacturers and shippers.

Oil Paper, Stencil Paper and Inks. Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 60c or $6.00 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples

A. J. BRADLEY MFG. CO.
99 Beekman Street NEW YORK

AUTO GYP
Process of Dyeing

Are You Troubled With BLEACHING?--

AUTOGYP is the process of dyeing that entirely eliminates the disagreeable bleach for all time. It is not an experiment. It is the practical method of dyeing and bleaching in ONE operation. The AUTOGYP Process of Dyeing is rendering remarkable results at equally remarkable savings in mills all over the country. Not only does it bleach and dye to the required shade, but it also produces a better looking fabric with a softer feel, and further saves:

Six separate steps and operations.
3½% of shrinkage.
25% of tensile strength.
50% of steam.
30% of labor.
90% of water.

It saves all the chemicals used in the chloride of lime method of bleaching. It saves boiling out in kiers or other appliances. No special skill or special equipment is necessary and no added expense involved.

Let us explain more fully the merits of AUTOGYP. Let us help you make your dyeing pay you a profit. Let us show you the many other ways AUTOGYP can be a real money producer for you. Our representative will be glad to call, or a post card will bring full information by return mail.

Write us.

Surpass Chemical Co.,
Albany, N. Y.

Dyes And Bleaches

SURPASS CHEMICAL CO'S FORMULA IN AUTOGYP PROCESS OF DYEING
AUTOGYP
PATENTED IN U.S.A. SEP. 26 1916 IN CANADA OCT. 10 1916
ALBANY N.Y.

In One Operation

Sulphurous Acid Generator

Assures A Uniform, Neutral Product

THE SULPHUROUS METHOD is not only more economical as an anti-chlor, but eliminates all danger of goods being tendered on dryer and assures a uniform, neutral product. No other anti-chlorine method can produce as soft, white or brighter bleach.

You can make your own anti-chlor in the form of sulphurous acid, in your own bleach house only in quantities to meet your immediate demands. The MACOMB Sulphurous Acid Generator manufactures it at a much lower cost than you can secure it elsewhere. It saves two washings, and effects a great saving in power, labor and loss of time, and allows washers to produce more.

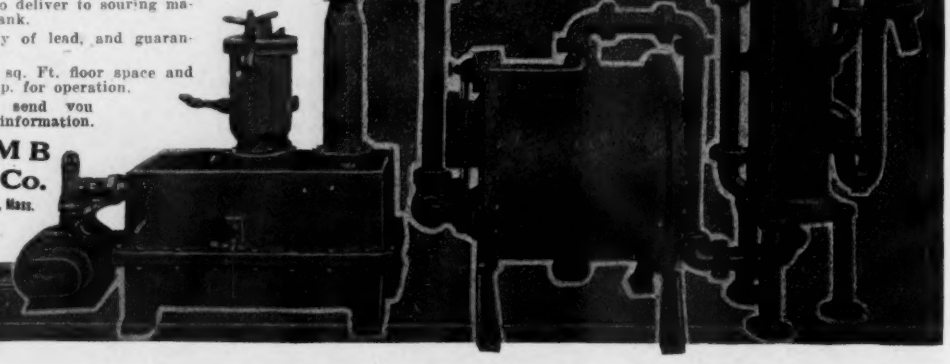
Can be installed to deliver to souring machine or storage tank.

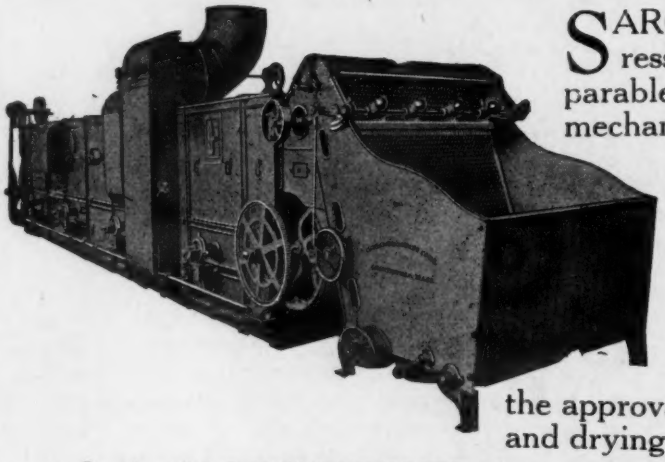
Constructed wholly of lead, and guaranteed gas-tight.

Occupies only 36 sq. Ft. floor space and requires only 2 h.p. for operation.

Let us send you detailed information.

MACOMB Machine Co.
230 Newton St., Waltham, Mass.





SARGENT DRYERS mark progress in Dryer Development comparable to that made in other fields of mechanical endeavor.

They are favored with a natural preference because they are designed on basic principles of air circulation, conveying and general drying apparatus construction, which have had the approval of discriminating mill men and drying engineers for many years.

In the SARGENT DRYER these principles have been combined and refined, making a complete machine which is unexcelled.
For drying cotton, linters, wool, hair, flax and other classes of raw material.

C. G. SARGENT'S SONS CORPORATION, GRANITEVILLE, MASS.
Fred H. White, Southern Agent, Greenville, S. C.
R. C. Jefferson, Phila. Agt., Drexel Bldg., Philadelphia, Pa.

SARGENT DRYERS

"DEVELOPENE"

Leaves No Argument as to When

"BLACK IS BLACK"

WHY BE SATISFIED

with a RUSTY BLACK when you can have a RICH LUSTROUS BLACK by finishing your Hosiery with the latest, most efficient and satisfying patented preparation

"DEVELOPENE"

A Demonstration Will Convince You

Send us a pair of unfinished stockings, skein of yarn or a piece of fabric—cotton, silk, artificial silk, wool or mixes—which has been dyed black, washed, but not finished. We will finish it with "DEVELOPENE" and return to you.

There will be such an improvement that you will immediately want "DEVELOPENE" for finishing your goods.

No further softener—or soap—required. Makes hosiery slip on and off the board easily—leaves the product soft and pliable.

Kali Manufacturing Company

Manufacturing Chemists

1404-10 No. Front St. Philadelphia, Pa.

Sole Manufacturers of

Hydroxy Oil and Kali Chlorine Neutralizer

Steam Turbine Driven

HYDRO EXTRACTORS

The Most Satisfactory Drive Where Steam is Available

Turbine is entirely enclosed.

Belt troubles are eliminated.

Speed closely regulated by reliable governor.

No packing boxes to stuff; no piston rings or slide valves to wear; no bearings to be taken up.

Ball bearings throughout, running in oil baths.

Exhaust steam is clean and can be used for boiling-off, heating or drying.

Basket can be started in any position by simply turning on the steam.

Asbestos lined band brake locks in "on" and "off" positions, and can be adjusted to stop the extractor as quickly as desired.

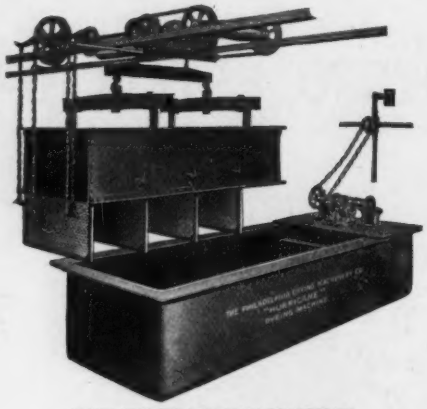
FLETCHER WORKS

FORMERLY SCHAUM & UHLINGER.

Glenwood Avenue at Second Street

PHILADELPHIA, U. S. A.

Western Representatives:
R. R. Street & Co., 28 N. Clinton St., Chicago, Ill.
New England Representatives:
Hurricane Engineering Co., 53 State St., Boston, Mass.
Southern Representative:
Howard Morshead, Glenwood Ave. & 2nd St., Philadelphia, Pa.



RAW STOCK DYEING MACHINE

"HURRICANE" Raw Stock Dyeing Machines are suitable for dyeing Cotton and Wool Stock and Carbonizing Wool Stock and Rags.

The Automatic Reverse Motion provides for change of direction of liquor flow at intervals.

This insures perfect penetration and even dyeing of the stock.

After dyeing, the material is left in a loose, lofty condition. The machines are constructed of wood with bronze fittings, or entirely of metal, as desired.

Catalogs on request.

The Philadelphia Drying Machinery Co.

Office and works: 3351 Stokely St. **Philadelphia, Pa.** Boston Agency: 53 State St.

DURABLE K-W UNIVERSALLY USED

KLAUDER - WELDON
DYEING - BLEACHING- SCOURING MACHINERY

There are K-W machines in use which were built nearly half a century ago and which are still doing their work efficiently and economically under severe service. This is sufficient evidence of the durability and capability of K-W machines after long years of subjection to the ravages of live steam, heat and alkalis.

K-W Machinery, by its accomplishments, has steadily and irresistibly built up a reputation that has made the name "Klauder-Weldon" synonymous with the "world's best dyeing, bleaching and finishing machinery."

Our interest in upholding the K-W reputation means that you MUST be satisfied, and our suggestions to prospective purchasers are made with the view toward solving any dyeing, bleaching or scouring problem for all time. We will be glad to answer any and all questions without obligation on your part whatsoever.

Write today for K-W Literature

THE KLAUDER-WELDON DYEING MACHINE CO.

Bethayres, Pa., U. S. A.

H. G. Mayer, Southern Agent,
Realty Bldg., Charlotte, N. C.

DRYING

TEXTILE MATERIALS of all kinds are dried by "Proctor" Dryers—dried much more economically than is otherwise possible.

The "Proctor" organization has specialized in drying machinery since 1883—a longer time, on a broader scale, than any other organization. Its vast experience equips it to render invaluable help when you investigate machinery for drying your products—also to give matchless service-value in the "Proctor" Dryer you will be sure to select as the most practical and profitable equipment for your needs.

Write for a catalogue, mentioning the material you wish to dry.

PROCTOR & SCHWARTZ, INC.
formerly The Philadelphia Textile Mach'y Co.
PHILADELPHIA, PA.

"Proctor" DRYERS

FILTERS

PRESSURE GRAVITY

Especially designed to meet all requirements of Textile Mills.

Economical in upkeep.

Perfect satisfaction.

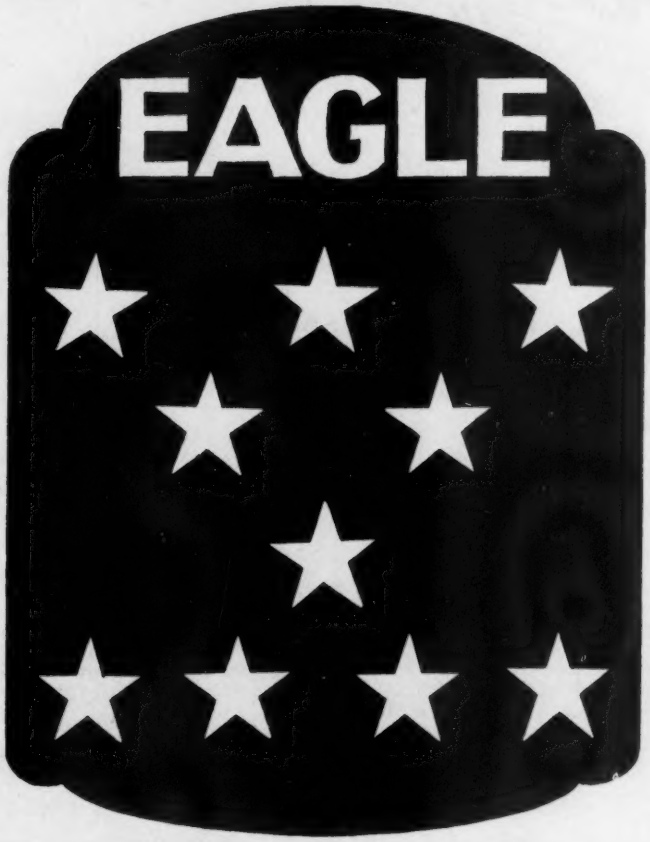
NORWOOD ENGINEERING CO.

Florence Mass., U. S. A.

CHAS. M. SETZER, Southern Representative,

Charlotte, N. C.

Starch



—and these stars have a meaning—

They signify the different grades in which Thin Boiling Eagle Starch is offered to the textile industry.

Being the pioneers in the manufacture of **Thin Boiling Starches** we are gratified at the widespread recognition they have received.

Be sure to select the best grade suited to your work. Our knowledge and experience are at your service.

Corn Products Refining Company

New York

Southern Office *Greenville, S. C.*

Starch

The Grasselli CHEMICAL CO.

CHEMICALS ZINC GRASSELLI EXPLOSIVES DYESTUFFS

Dyestuff Dept 117 Hudson St. New York, N.Y.

KATIGEN DEEP BLACK GGN Conc.

The Ideal Sulphur Black for Hosiery

The quality and value of GRASSELLI DIRECT CORDOVANS are attested to by the number of satisfied customers using them.

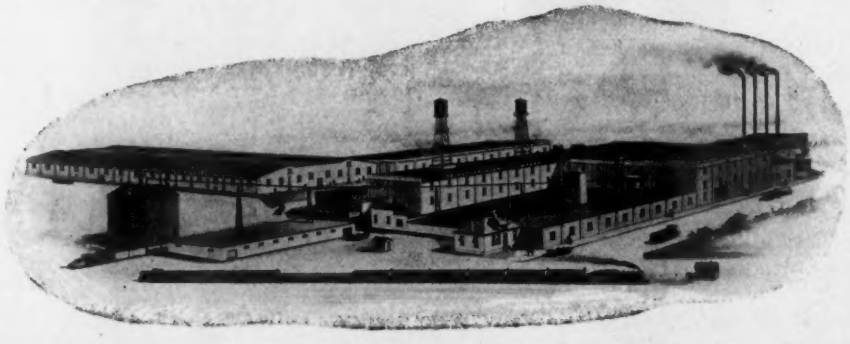
Shades matched and quotations furnished promptly.

Factories at
Rensselaer, N. Y.
Grasselli, N. J.

Branch Offices
Boston Providence
Philadelphia Chicago
Charlotte New Orleans
San Francisco

The
GRASSELLI CHEMICAL CO., LTD.
Toronto Montreal
Canada.

Sole Selling Agents for
ESSEX ANILINE WORKS, INC.
BOSTON, MASS.



VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

Beam Bleaching and Dyeing

(Brandwood's Patents)

Up to twelve Beams, Bleached or Dyed at One Operation, Indigo, Vat, Napthol, Sulphur and Direct Colors.

Cost in labor and materials guaranteed less than by any other System.

We give definite guarantees in our Contracts as to cost of labor and materials and quality of work.

Users of our Bleaching and Dyeing Plants have the exclusive free benefit of Twenty United States Patents, giving great advantages in Warping, Bleaching, Dyeing, Drying, Quilling and Splitting, and not available by any other System.

We further give the use of valuable secret processes, and many years' practical experience. We start up the Plants free, and give free service at all times.

Reckoned on basis of production, our Plants are cheapest in first cost.

We are prepared to install Plants and take payment, as and when saved by their use.

Most of the Chambrays and stripes now manufactured in the U. S. and Canada, are bleached and dyed on our Plants.

Exclusive Patent Rights are still available for some States and Territories.

Raw Stock Bleaching and Dyeing

(Brandwood's Patents)

Bleaching or Dyeing continuously in One Apparatus up to fifteen hundred pounds per hour, Indigo, Vat, Naphtol, Basic Developed, Sulphur and Direct Colors.

Cost in Labor and Materials guaranteed less than by any other system.

Dyehouse labor in handling the cotton before and after dyeing, and hydro-extracting is eliminated.

Three-fourths of the labor costs and three-fourths of the dyehouse floor space is saved.

Spinning production considerably increased.

No shortening, weakening or matting of the cotton.

Colors brighter and evenly dyed.

We give definite guarantees in our Contracts as to cost of labor and materials and quality of work.

We start up the Plants free and give free service at all times.

Exclusive Patent Rights are being granted to Colored Goods Manufacturers for their own State or Territory.

For full particulars apply to

JOHN BRANDWOOD

ELTON COP DYEING CO., LTD.

BURY, ENGLAND

Rohm & Haas Company

Manufacturers of

CHEMICALS

BRISTOL, PA. PHILADELPHIA, PA.

Specialties

LYKOPON — Concentrated Hydrosulphite for reducing Indigo and vat dyes.

FORMOPON—For discharge work.

FORMOPON EXTRA — For Stripping.

INDOPON W—Indigo Discharge Assistant.

TARTAR EMETIC—Technical.

Represented by

The MAKENWORTH COMPANY

Greensboro, North Carolina

Chas. Lennig & Company

Incorporated

40 North Front Street Philadelphia, Pa.

Works: Bridesburg, Philadelphia, Pa.

Manufacturers of

Concentrated Sodium Sulphide

Crystal Sodium Sulphide

Also manufacturers of the following chemicals:

ALUM	GLAUBER SALT
SULPHATE OF ALUMINA—	OIL OF VITRIOL
Iron Free	NITRIC ACID
PAPER MAKERS' ALUM	MURIATIC ACID
WATER FILTRATION ALUM	NITRATE OF LEAD

Represented by

The MAKENWORTH COMPANY

Greensboro, North Carolina

Established 1815

ARNOLD, HOFFMAN & CO., Inc.

Providence New York Boston Philadelphia Charlotte

All Kinds of

HEAVY CHEMICALS

Sole Agents for

BELLE ALKALI CO.

of Belle, W. Va.

Manufacturers of

LIQUID CHLORINE
BLEACHING POWDER
CAUSTIC SODA

Solid and Flaked

We solicit your inquiry for prompt or future delivery

Staley's Starch

Absolutely Uniform

Scientific control over every step of production, and manufacturing facilities unsurpassed, guarantee the strict uniformity and unvarying quality of Staley's starches, whether the quantity be a single bag or a trainload.

The preference of hundreds of the largest mills has made our Eclipse Thin Boiling Starch the standard of the textile industry. Other starches of equal excellence and dependability are available to meet special requirements.

Let us send you samples and prices.

A. E. STALEY MFG. CO.
DECATUR, ILL.

508 Andrews Law Bldg., Spartanburg, S. C.

J. W. Pope, Care Ansley Hotel, Atlanta, Ga.
25 Church St., New York City.
88 Broad St., Boston, Mass.

"BRETON" MINEROL "F"

For
Cotton Print Goods
"It softens uniformly the blotch."

BORNE, SCRYMSER CO.
Established 1874
80 South Street, NEW YORK
BOSTON **PHILADELPHIA**
Works: Elizabethport, N. J.

YOU would not consider it good business to keep a poor worker while a better workman is readily obtainable. Neither would you consider it good business to use any other than

WYANDOTTE DETERGENT

when you know the exceptionally efficient and economical work it is doing in hundreds of mills.

This abrasive cleaner is unusually efficient in maintaining oil painted walls, ceilings, and woodwork fresh and bright, often saving the cost and annoyance of repainting.

Then, too, it has many other uses, proving as it does equally effective on tile, linoleum, enamel, and porcelain surfaces.

Indian in Diamond

in every package

An order on your supply house will prove that the quality of Wyandotte Detergent is of the same high character as other Wyandotte products.

THE J. B. FORD CO., Sole Mnfrs.,
WYANDOTTE, MICH.

NEW LEAFLET ON KIER BOILING

Send For It Today!

Scientific information that should be in the hands of every mill man.

Address

SOL-ESCO
Lockport, N. Y.
Electric Smelting & Aluminum Co., Inc., Sole Mfrs.

ciba Co. Inc.
BOSTON BRANCHES PROVIDENCE
PHILADELPHIA
COLUMBUS, GA.
CEDAR and WASHINGTON STS.
NEW YORK

Fast Developed Colors
for Silks and Cottons

Exceedingly fast for washing
and cross dyeing.

ROSANTHRENES
Yellows — Oranges — Reds — Bordeaux

INDIGENE
Blues and Blacks

Sole Representatives
in the United States
for the
Society of Chemical Industry
in
Basle, Switzerland

Sole Selling Agents for Dow's
Indigo and Midland Vat Blues

JACQUES WOLF & CO.
Manufacturing Chemists and Importers
PASSAIC, N. J.

ALL FINISHING and SIZING PRODUCTS for COTTON

ANTISTAIN
MONOPOLE OIL
Reg. Trade Mark No. 70991
BLEACHING OIL
Kier boil Assistant
HYDROSULPHITE
For stripping and discharge printing
CREAM SOFTENERS
ALIZARINE ASSISTANTS

Uniform in Application

VICTROLYN

Penetrating, Lubricating, Dependable
Assistant in Warp Sizing

KLORASENE

will remove Oil Stains.

If you are troubled, write us.

BOSSON & LANE
Manufacturing Chemists
ATLANTIC, . MASS.

Demanded By The Majority

Philadelphia Roller, Clearer and Slasher cloths are **demanded** by America's foremost textile mills.

Roller Cloths—Our Roller Cloths are made of the right material with exactly the correct cushion and uniformity of surface to produce the most desirable results.

Clearer Cloths—Clearer cloth is constructed of high grade material with thick, strong nap that does not pull out and its uniform length is such that the rolls are completely cleared of all short fibre.

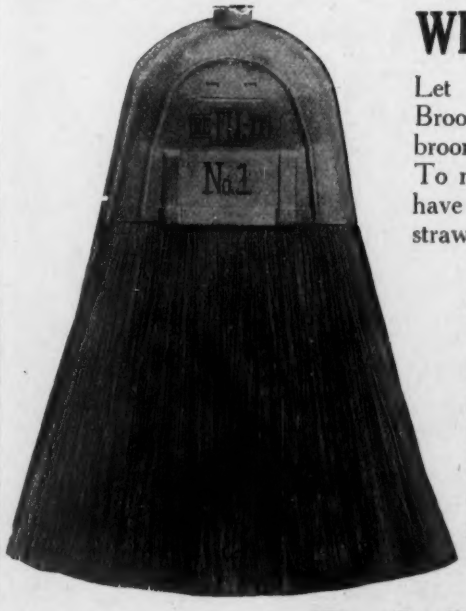
Slasher Cloths—Our Slasher Cloth is made of the best material of sufficient cushion and porous to thoroughly force the sizing into the yarn.

Let us send you a trial order to convince you.

PHILADELPHIA FELT COMPANY

FRANKFORD, PHILADELPHIA, PA.

Southern Sales Agent: M. C. Sanders, Greenville, S. C.



Why Buy New Brooms?

RE-FIL-IT

Let us supply you with RE-FIL-IT Brooms for YOUR mill. RE-FIL-IT brooms are just what the name implies. To make your old brooms new, all you have to do is just insert a few sections of straw—if you use RE-FIL-IT Brooms—

No need to go to the expense of buying new brooms continually.

There is no need for us to tell you the great saving effected—any mill man can instantly see the unusual economy of RE-FIL-IT Brooms.

For complete information, prices and other interesting data, you have but to drop us a postal.

Note the easy manner in Which RE-FIL-IT BROOMS are made new by occasionally transferring the filler sections.

The Re-Fil-It Broom Mfg. Co.

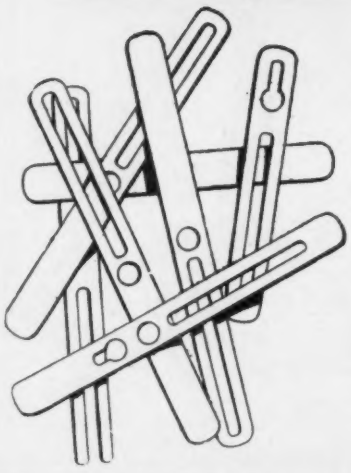
OFFICE:

185 Devonshire St.

BOSTON, MASS.

RE-FIL-IT

GREIST



Satin Finish Loom Drop Wires
are *Good Wires*

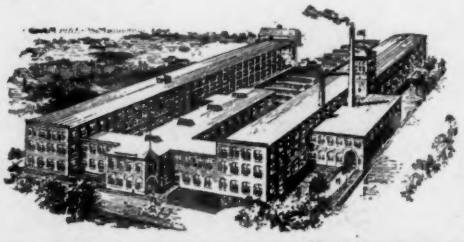
Uniformly made—free from burrs
a reliable source of supply.

The Greist Manufacturing Company,

Dept. "C,"

New Haven, Conn.

Southern Representative
The G. G. Slaughter Machinery Co.
Greenville, S. C.



SPINNING RING SPECIALISTS SINCE 1873

SPINNING RINGS
TWISTER RINGS
SILK RINGS

DIAMOND FINISH

TRAVELLER CLEANERS
TRAVELLER CLIPS
GUIDE WIRE SETS

WHITINSVILLE SPINNING RING CO.
WHITINSVILLE, MASS.

WALTER L. PARKER CO.

LOWELL, MASS.

Manufacturers of Bobbins, Spools and Skewers

OUR SPOOLS:—

Are made to stand severe service and are made from thoroughly dried stock, so constructed that they are giving entire satisfaction.

OUR BOBBINS:—

Are made from the best grade of stock, and through the efficiency of our workmanship, are true running, and properly fitted on spindles.

OUR PRODUCTS:—

Bobbins—Warp and Filling. We put on all kinds of metal shields and caps.
Speeders—Plain; steel rings; metal base.
Spools—Warper; Twister.
Our Metal Bound Spools are pronounced the best on the market.
Skewers—Cop, Warper and Roving, of all descriptions.
Twisters—Universal Winder Rolls and Bobbins, Comber Rolls, etc.

We Specialize in New Mill Equipment

CHARLOTTE SUPPLY CO., SOUTHERN AGENTS.

THE BELGER CO., BOSTON, MASS.

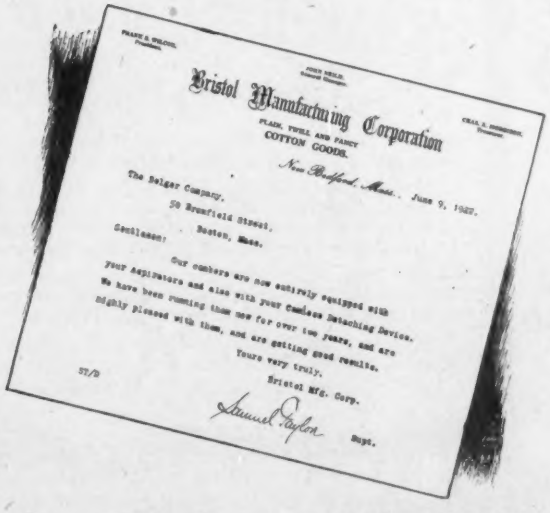
FORMERLY J. WEINBRENNER & CO.

Roth's Pat. Improved ASPIRATORS and Roll Waste Packers for ALL MAKES OF COMBERS

BETTER COMBED and CLEANER SLIVER

SAVINGS in WAGES, HALF LAPS AND BRUSHES.

WASTE of same good quality as with old doffer arrangement.


Bristol Manufacturing Corporation
PLAIN, TWILL AND FANCY COTTON GOODS.
New Bedford, Mass., June 9, 1922.
The Belger Company,
50 Brenfield Street,
Boston, Mass.
Gentlemen:
Our combers are now entirely equipped with your Aspirators and also with your Camless Detaching Device. We have been running them now for over two years, and are highly pleased with them, and are getting good results.
Yours very truly,
Bristol Mfg. Corp.
Samuel Taylor Supt.
ST/D

PATENTED CAMLESS DETACHING MOTION for NASMITH Combers.

INCREASED PRODUCTION

with same good quality of combed sliver for which the Nasmith comber is so well known.

LESS POWER,

SIMPLIFIED SETTINGS and ADJUSTMENTS.

WASTE is drawn direct from brush to perforated cylinder.

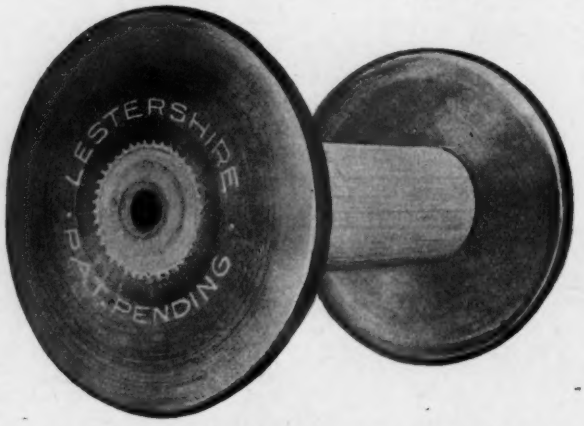
WASTE delivered separately for each comber head.

NOISELESS WORKING—

This mechanism replaces the big cam, the quadrant and pinion, clutch, clutch operating cam and lever of the present machine.

ALSO IMPORTERS OF TURKEY RED YARNS FAST TO BLEACHING

What Part of the Spool is First to Wear Out?



Your superintendent will confirm our statement that 99% of all Warper, Twister or Spooler Spools become useless on account of the heads breaking, wearing rough or loosening. This is true of all types of Spools heretofore on the market.

With the Lestershire Type Vulcanized Fibre Head Spools just the opposite is true. The Heads will outwear the barrels because Hard Vulcanized Fibre (the same material from which end thrust bearings and automobile gears are made) will never break, wear rough nor splinter.

Of course the first cost is higher but, figuring your charges per thousand spools per year, they are by far the most economical spools on the market today.

In addition Lestershire Fibre Head Spools will in the ordinary mill give you an increased unloading production of nearly 50%. Put a row on your creel and compare the time necessary to unload with any other type Spool.

On the smooth Rock Maple barrel, cleanly jointed to the Fibre Heads which cannot get rough and cannot be dented, there is no place for the yarn to catch.

Spindle wear is also eliminated by bushings of hard well seasoned Dogwood.

Increased traverse can be had which will give you greater yardage on your spools. This means a saving of many dollars in the course of a year, not only direct but in labor required to change the spools.

At your request we will gladly send samples for purposes of test and comparison.

LESTERSHIRE SPOOL & MFG. CO.

Manufacturers Mill Spools, and Bobbins, of Every Description

JOHNSON CITY, N. Y.

VERMONT SPOOL & BOBBIN CO.

OF

BURLINGTON, VERMONT.

There are two prime requisites in the production of superior bobbins and spools—the plant and long experience. We have both.

Our plant is equipped with the most up-to-date and efficient machinery. From the selection of the wood to the finishing of the product the same care is exercised in every department—uniform bobbins and spools of the highest class being the result.

Our long experience in the design and manufacture of spools and bobbins for textile mills all over the country enables us to understand your requirements and give you 100% satisfaction.

Give us a trial order and you will remain one of our satisfied customers. Write for prices.

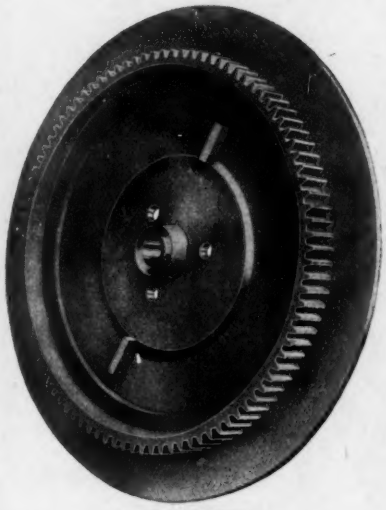
"Good Goods at Fair Prices."

All Steel Loom and Section Beam Heads

Mill Executives are Specifying All Steel Heads on New Equipment.

STEEL heads represent permanent equipment. The first cost is the only cost.

Once installed all expense of maintenance is eliminated.



PATENTED

GUARANTEED not to bend or spring under pressure of warp or handling of beams. Constructed to duplicate present cast-iron heads.

Ask for samples.

PATENTED

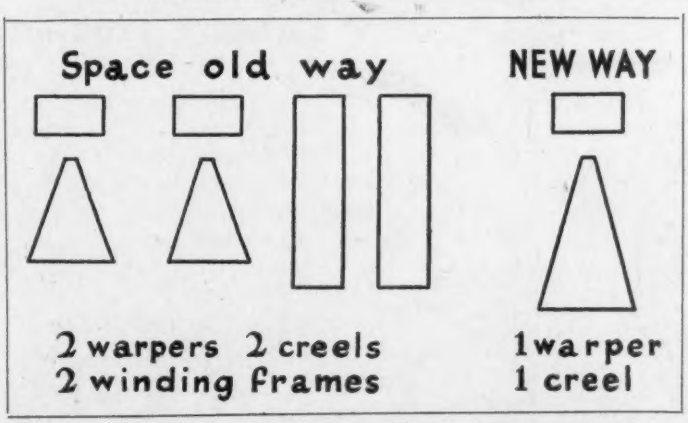
Mossberg Pressed Steel Corporation

Attleboro, Mass.

Southern Representative:
Southern Textile Specialty Co., Greenville, S. C.

NEW AUTOMATIC CREEL

for direct warping from FILLING WOUND BOBBINS



COMPLETELY ELIMINATES the

Spooling of the yarn

Spooling waste

Undue and irregular tension of yarn due to spooling

Stoppage for doffing

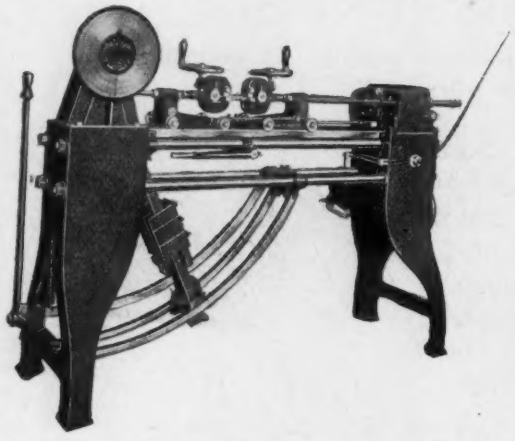
Doffing is done while warper is running.
Greater production from better warps at lower cost.
Better loomage from auto-creel warps because
Elasticity is preserved in yarn.

For Information address

AUTO CREEL CORPORATION, NEW YORK

Room 915, Fifth Ave. Building
Alfred Suter, Sales Manager

SCOTT TESTERS



THE SCOTT HORIZONTAL 800 LBS. CAPACITY—INCLINABLE BALANCE FABRIC TESTER

An American Invention, Built in America by Skilled American Mechanics and adopted as the Standard for testing all heavy fabrics for American requirements.

We also build the Standard Testing Machines for Light Fabrics, Yarns, etc.

HENRY L. SCOTT & CO.

BLACKSTONE & CULVER STS., PROVIDENCE, R. I.

How do you make time studies in your plant? Does somebody hold a stop-watch? Here's a "stop-watch" that you can bolt right on to any machine in your plant. The heavy Black lines on this chart indicate *productive time*. A simple graphic record of this most valuable data is a direct result of the use of the Servis Recorder.
Let us tell you what a plant engineer of one of the large steel companies has to say about this device. It will interest you because it means saving labor and money in your plant. Write us today for the complete story.

A Time Clock for Textile Machinery

$128.00 complete

The Service Recorder Company

Cleveland

SAVOGRAN

For more than forty years has cleaned MILL FLOORS, cleaned them clean and preserved the surface.

India Alkali Works Manufacturers! Boston.

Are Your Steel Rolls Causing Trouble?

Have Them Repaired. We are equipped for renecking, refluting, stoning, honing, polishing. We place your rolls in first-class condition, at a small cost.

Write us regarding what we can do to increase the output of your mill by overhauling and repairing your machinery.

Southern Spindle & Flyer Co., Inc.

Manufacturers, Overhaulers and Repairers of Cotton Mill Machinery,

CHARLOTTE, N. C.

W. H. MONTY, Pres. and Treas.

W. H. HUTCHINS V.-Pres. and Sect.

WASHBURN KORE-LOKT PIN BOARDS

"The Old Bobbin Boxes are going"

This cut shows a type of pin board construction which has successfully replaced bobbin boxes on looms.

There is a "Kore-Lokt" Pin Board to fit every textile need. Other styles are fitted with hollow or solid steel pins, with wire pins and with special wood pins, but in every type the Kore-Lokt principle is retained.

Be modern. Always consider your doffing problems in terms of pin boards. They are indispensable in measuring and controlling the operation of automatic looms. They answer every doffing requirement throughout the mill.

We invite superintendents and overseers to correspond with us concerning pin board systems. Let us send you a list of prominent mill users, each and every one of whom considers pin boards an essential factor in their success.

NEW BEDFORD MASSACHUSETTS

AS EASY AS LOOKING AT YOUR WATCH

We make Indicating and Recording Liquid Level Gauges, Thermometers, Pressure Gauges, CO_2 Recorders, Temperature Controllers, etc., for use on
Size Boxes
Dye Tubs
Bleaching Kiers
Slashers
Drying Machines
Kettles
Steaming Boxes
Drying Cans
Woolwashers
and for the
Power Plant.

Whether a machine is running at 100 or 12,000 R.P.M. you can find out its exact speed in an instant with a Foxboro Tachometer. It shows at a glance the speed of spindles, front rolls, flyers, slubbers, intermediates, jock frames, machine shafts, pulleys, motors and generators.

The Foxboro Tachometer makes it easy to develop and maintain speed standards, without which serious production losses frequently occur. It is not affected by vibration, magnetism or temperature and can be held in any position. Readings are instantaneous and accurate. The pointer does not flutter.

The selective speed changing mechanism makes it possible to read very closely and yet cover a wide range of speeds. Range finding is automatic and there is no adjusting or changing of connecting pieces.

Trial will convince you that Foxboro Tachometers are logical equipment for your mill. Write to Dept. A. S. for information as to our free trial offer.

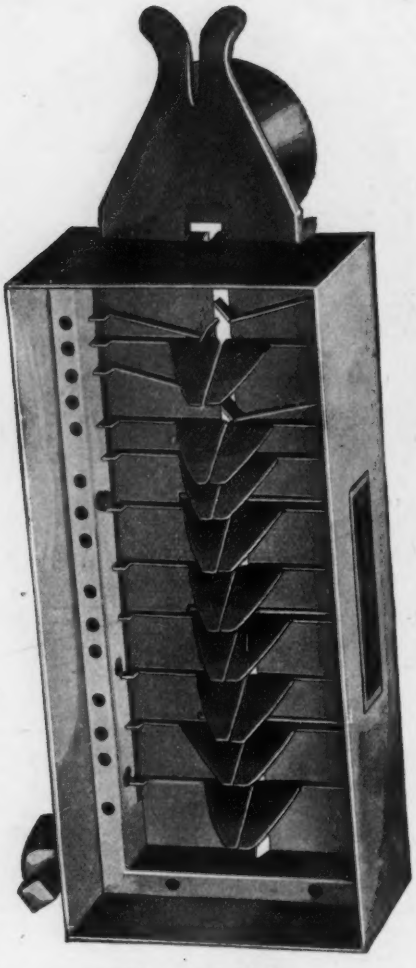
THE FOXBORO CO., Inc.

FOXBORO, MASS., U. S. A.

New York Chicago Boston Tulsa
Pittsburgh Philadelphia San Francisco Birmingham

FOXBORO
TRADE MARK

118-206



The Eclipse
AUTOMATIC YARN CLEANER

An entirely new principle is involved in that the yarn is cleaned by **flexible** blades which vibrate **constantly.** This device is small and compact and easily attached. The strength and elasticity of the yarn is not affected in the slightest.

When writing, state make of spooler or winder.

ECLIPSE TEXTILE DEVICES, INC.

ELMIRA, N. Y.

Makers of
Automatic Yarn Cleaner
Automatic Stop Motion
Yarn Tension Device

L-V-B SPOOLER TENSION

L-V-B Tension Device.

Here's What One Mill Saves

In a mill that changed from warp to filling wind on 20,000 lbs. production, the following result was obtained:

Warp Wind	Filling Wind
Stick Waste 80%	Stick Waste 60%
Spooler Waste 200 lbs.	Spooler Waste 50 lbs.
1050 doffs.	650 doffs.

Increased production 5% due to less doffing and less breakage.

Changed warp bobbins $7\frac{11}{16}$ to filling bobbins $8\frac{3}{4}$".

Increased speed of spooler from 800 R.P.M. to 1200 R.P.M.

Eliminated ⅓ of spoolers; also improvement on slashing, warping and weaving.

Change from Warp to Filling Wind. Try it out at our expense.

Send 2 filled bobbins and we will forward sample tension on approval.

The L-V-B Spooler Tension means greater production, better spinning and 50% Saving in Waste. Ask for a list of mills that are using L-V-B Tensions.

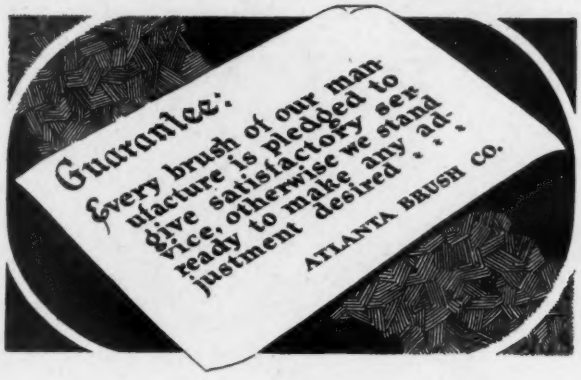
ADDRESS

Textile Specialty Company

P. O. Box 531, New Bedford, Mass.

A. B. Carter, Southern Agent,

L-V-B Tension Co., 210 Realty Bldg., Gastonia, N. C.


Guarantee:
Every brush of our manufacture is pledged to give satisfactory service, otherwise we stand ready to make any adjustment desired . . .
ATLANTA BRUSH CO.

ASIDE from all thought of price or service, every cotton mill man knows it was our A. B. C. guarantee that placed brush buying on an efficiency basis. In other words, you know, when placing your order, what to expect—what you are going to get.

The success of our brushes is due to the fact that we know what kind of brushes are needed in textile mills, and we also, realize the importance of making them as good as it is possible for brushes to be made.

We have the facilities, machinery, equipment, ample space, abundant light, experienced workmen, and the desire to excel.

Perhaps that is why nine-tenths of the brushes used in Southern cotton mills are made by the

Atlanta Brush Company
Atlanta, Ga.

ATLANTA BRUSH COMPANY

A Brush for every Textile Need

A Scrubber With Eight Hands!

No human hands, these to tire and shirk! No man or woman on hands and knees wields these brushes! Sheer muscle could not put 60 pounds pressure back of them. No human could send them whirling around at 125 revolutions per minute.

EDISON LAMP WORKS
Newark Plant
One of the several plants of this company where CLEAN FLOORS are maintained by the FINNELL SYSTEM

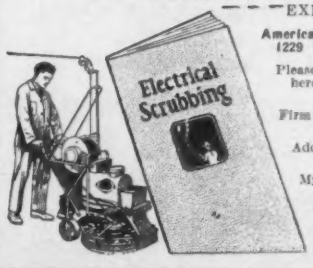
Best of all, there's no pail of dirty water to be slopped on the floor and then mopped off, but a constant shower of CLEAN water from the tank above the scrubber—CLEAN water for every square inch!

Electricity does it! Electric scrubbing is here to stay. Send for booklet shown below—the story of electric scrubbing.

AMERICAN SCRUBBING EQUIPMENT CO.
General Offices and Factories
HANNIBAL, MO.
District Offices in Principal Cities.

"Clean Floors Reflect Clean Business"

FINNELL SYSTEM
OF ELECTRIC SCRUBBING



EXECUTIVE'S MEMO.

American Scrubbing Equipment Co.
1229 Collier St., Hannibal, Mo.

Please send brochure shown here to

Firm Name .....

Address .....

My Name .....

Title .....

The Box Truck
that exactly fits textile mill uses

All direct and indirect handling economies are enjoyed by the many leading mills that use Lewis Box Trucks, Transfer Trucks and Baskets.

Built to last ten years and longer—light in weight—pilfer proof — supplied with detachable and washable canvas liners—fitted with thread guard casters—shipped KD—manufactured in large quantities and priced accordingly.

We have never failed to save the mill money when a textile handling problem was put to us. Lay your problem before us and we will gladly offer suggestions. Write today for the Lewis "Bulletin on Trucking in Textile Mills."

LEWIS
Box Trucks

G. B. LEWIS CO., Box Truck Div. C. 17 WATERTOWN, WIS.

John Cronin, 13 Hamilton St., Boston, 25, Mass.; Mill Specialties Co., 439 Arch St., Philadelphia, Pa.; W. Gracey, 230 Broad St., Spring City, Pa.; E. C. Buehrer Co., 18 Front St., San Francisco, Cal.; J. D. Collins Sales & Engineering Co., 55½ Luckie St., Atlanta, Ga.; R. E. Stanton Equipment Co., 615 Ryan Annex, St. Paul, Minn.; R. R. Street & Co., Inc., 28 N. Clinton St., Chicago, Ill.; Edw. L. Koenig Co., 23 W. Kinzie St., Chicago, Ill.—Detroit address—Ryerson Bldg.—Milwaukee address—114 Grand Ave.—Alvin Lovingood, 14 Walker St., Atlanta, Ga.

REEDS

For Cotton, Woolen, Worsted, Silk, Tire Fabrics, Webbing, and Wire Cloth.

We make a specialty of all Metal reeds, for Tire Fabrics, and Leno work.

HAYES LOOM REED & HARNESS CO.

182 Farm St. Woonsocket, R. I.

The Palmer Adjustable Thread Guide

For Ring Spinning and Twisting Frames

Easily Adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

Middletown, - - - Connecticut

AMERICAN
SUPPLY COMPANY
PROVIDENCE, R. I.

MANUFACTURERS OF

Loom Harness,
Weaving Reeds,
Oak Tanned Leather
Belting, Strapping,
Etc.

We make a specialty of Harness for Warp Drawing Machines

NOTE—No orders too large for our capacity. None too small to receive careful attention.

Standardize
The Day's Work

Keep your operators working at their best. Let them see what their machines are producing. It puts "pep" into their work, and strengthens your bank balance.

The Productimeter

This never-tiring little machine shows the operator all the time, just what his loom or other machine is turning out. It raises the day's work to a high standard, and keeps it there.

Thirty Days' Free Trial

Tell us what machine you desire to use it on, and we will send you a Productimeter for 30 days' free trial.

Get our complete CATALOG. It will give you some money-saving ideas. Free for the asking.

DURANT *Manufacturing Company*

633 Buffum Street **Milwaukee, Wis.**

(1135)

Obtain Standardized Costs
Set Piece Work Rates

Here's the Watch for Every Textile Time Study Job.

Only six seconds waste on an operation in an eastern factory—but locating it with the watch saved thousands every year. A nationally known Textile concern says: "We eliminated one-fourth the labor, cut costs by 22%." Cheney Bros., Champlain Silk Mills, Unity Spinning Mills and many others are doing the same thing. How? By Time Studies with Silberberg watches. **Whether it's locating wastes, setting piece work rates, establishing bonus systems** or many other uses—there's a Silberberg instrument specially made for the job.

The Decimal Duration Watch—Gives production figures up to three minute jobs with special arrangements for timing jobs up to 30 minutes. It also has the decimal dial and "take out time" feature

With each purchase of any type of our watches we will include at **no additional charge** one set consisting of our 3 Text Lesson Course on "TIME AND MOTION STUDY" including how to set **Piece Work Rates** and how to obtain accurate **Labor Costs.** All data contained therein broadens the scope and use of Time Study Watches in the Industries.

This course regularly sells for $10.00. **Absolutely FREE with each Watch.** Send for illustrated pamphlets and catalogues. **Any of our instruments on approval to responsible concerns.**

MORTIMER J. SILBERBERG CO.

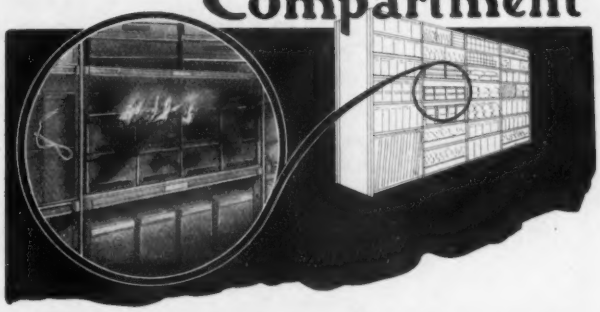
Peoples Gas Bldg. CHICAGO

Pioneers in the Manufacture and Sale of Time Study Watches.

The watch illustrated at the top with the decimal dial and "take out time" features gives direct readings in production per hour up to one minute jobs.

The Master Chronograph

Confined to a Single Compartment



A Fire Will Usually Burn Itself Out

—IN—

LYON STEEL SHELVING

Lyon Steel Shelving is fire resisting and a fire retardant. Each compartment is virtually a steel box. If a fire does start, it can only smoulder because of restricted ventilation. Fire cannot spread through steel walls.

The Chicago Street Railways Company had a wooden building equipped with LYON Steel Shelving. After a bad fire, the underwriter's report stated that this steel shelving saved the building from a total loss. The shelving is still in use.

Wooden shelving is truly a "kindling pile." Would you allow anyone to store a pile of kindling in your building?

It would be worth your while to ask the nearest District Office for further information.

LYON METALLIC MFG. CO.

AURORA, ILLINOIS

District Sales Offices:

New York Chicago Philadelphia Pittsburgh Cleveland Boston Detroit Rochester Los Angeles Indianapolis

Local offices in many additional cities. Look in your telephone directory.

LYON STEEL PRODUCTS

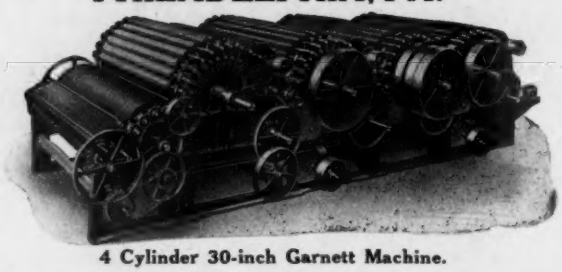
You want the best
Then use our
PATENT WOODEN BEAM HEADS
Reduce losses from breakage — Save Freight

ALLEN COMPANY, NEW BEDFORD, MASS.

COMBINATION SECTION BEAMS
Superior construction. Try Them.
ALLEN COMPANY, New Bedford, Mass.
Catalog on Request.

SMITH & FURBUSH MACHINE CO.
PHILADELPHIA, PA.

A Garnett Machine of this size will reduce to fibre hard twisted thread waste without materially shortening the staple. We also build smaller machines for working soft wastes.



4 Cylinder 30-inch Garnett Machine.

This Garnett is built on our sectional unit frame construction and contains many improvements which we will be glad to explain.

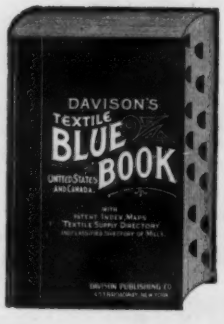
Ask for Circular S-182.

SINCE 1885 EFFICIENTLY SERVING THE TEXTILE INDUSTRY

One Thousand Seven Hundred

Pages of Latest Reports and Information on Cotton Mills, Woolen Mills, Knitting Mills, Dyers, Finishers, Cotton Merchants, Waste Firms, Wool Dealers, Dry Goods Commission, Etc.

Write, Wire, or Phone for your copy before the Limited Edition is Entirely Sold to the Trade.



35th Annual 1922 Office Size $7.50 Handy Size $5.00. Prepaid to any Responsible Firm.

DAVISON PUBLISHING COMPANY
50 UNION SQUARE NEW YORK
Telephone, Stuyvesant 1195-6

THE
"Southwestern Iron Clad"
Is the IDEAL Cotton Mill Broom

Only the best grade of broom corn is used in these brooms—they are built strong and will withstand the hardest usage.

The light weight, yet strong and substantial shields used gives the broom ample protection and at the same time allows the proper amount of broom corn to be used, thus giving them excellent sweeping qualities.

MADE RIGHT!
PRICED RIGHT!

Inquiries and orders receive prompt attention.
Sold direct and through
all principal distributors.

The Southwestern Broom Mfg. Co.
Evansville, Indiana

Keystone Fibre Warehouse Cars

Their lightness, strength and durability mean greatest economy expressed in more years of dependable service.

Keystone Fibre is assurance of utmost value.

Orders filled through any responsible mill supply house, or direct. Send for catalog of mill supplies.

KEYSTONE FIBRE COMPANY

Box 348, Wilmington, Delaware

Southern Representatives: Wilson Company, Norwood Bank Bldg., Washington St., Greenville, S. C.; New York Office: 30 Church St.; Chicago Office: 565 West Washington Blvd.; Philadelphia Office: 7 South 17th St.; Boston Office: 176 Federal St.

MEECO Metal Equipment For Shop And Factory

DRINKING FOUNTAINS

The Standard for 15 Years

Fig. 604 ICE-COOLED

Eleven Other Types From Which To choose

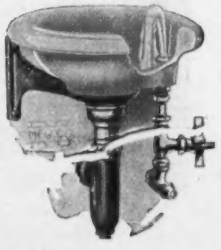
SANITARY—DURABLE—EFFICIENT—LOW IN COST

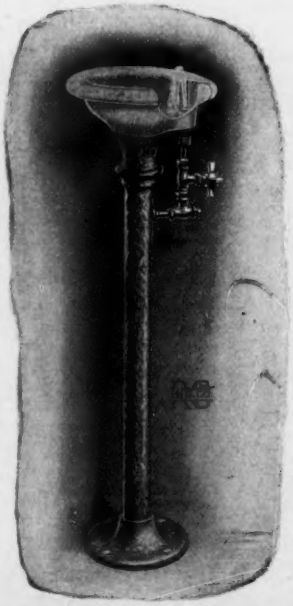
Write for catalog and new price list.

MFG. EQUIPMENT & ENG. CO.

FRAMINGHAM, MASS.

Protect Your Employees Health





With

"Vertico-Slant" Stream Fountains

The principles of construction are in accord with science, embodying the copious drinking feature of the vertical stream yet the stream is at such a slant as to eliminate the danger of contamination by germ-laden water falling back to the nozzle. The LIPS CANNOT TOUCH THE NOZZLE as it is located slightly above the sloping base of recess.

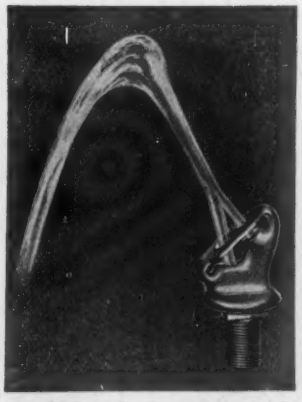
"Vertico-Slant" Stream Fountains are the last word in sanitary drinking fountains.

Let us send you more detailed information. Write us.

Rundle-Spence Mfg. Company

MILWAUKEE, WIS.

What Do You See Different About this Drinking Stream?



Look Carefully, then read what follows.

First, note the two stream side jet projector, guarded to be non-squirting, projecting two streams of water from the side of the fountain. Now note how these two streams meet as they rise, setting up an interference that builds a perfect drinking mound at the high point. This is the mound from which drinking is comfortable and convenient. This is the drinking mound that is being installed in numbers of leading schools, mills, and municipalities, simply because it is the most convenient, comfortable and sanitary drinking stream in use. It is different. It is distinctly a Halsey Taylor feature—the very highest development in drinking fountain streams, sanitary to the highest degree.

And further, whether the line pressure back of this stream is 60 pounds or 20 pounds, the stream is always just so high—NEVER TOO HIGH—NEVER TOO LOW. It is under perfect control by the Halsey Taylor Automatic Stream Control, another distinct Halsey Taylor feature not used in other fountains.

Just write us and we'll send you complete literature showing a type for every purpose.

The Halsey W. Taylor Co.

538 No. Park Ave., Warren, Ohio

Why Ball Bearings areEssential

In the operation of a typewriter practically all of the wear and friction comes at three points—the typebar joints, the capital shift and the carrier runways.

In the L. C. Smith & Bros. typewriter the typebar joints are ball bearing, so that every time a key is struck the ball bearings make easy the type movement. The capital shift moves up and down on ball bearings and ball bearings roll in the runways on which the carriage moves back and forth.

Consequently, whether the operator is striking the keys, shifting for the capitals, or returning the carriage, every operation is ball bearing.

What you would expect from such mechanical perfection is what actually happens—long life and ease of operation.

Send for illustrated catalog.

L. C. Smith & Bros. Typewriter Co.
Home Office and Factory, SYRACUSE, N. Y.
BRANCHES IN ALL PRINCIPAL CITIES

The Fan With Replacement Floats

Floats that are double angle supported, and riveted to, machined center, not cast into a hub.

The Bayley B

Exhaust Fan

The perfectly balanced fan that has reduced breakdown shutdowns to the lowest possible minimum. Handles sawdust, shavings, ashes or gases with equal efficiency. What users say about it is the most convincing argument in its favor. Send for bulletin today.

Bayley Mfg. Co., Dept. I.
Milwaukee, Wisconsin.

Kleradesk—your present system—plus

The Kleradesk adapts itself to your peculiar requirements—combining both horizontal and vertical handling of desk papers.

Sorts and routes departmental mail; holds reference papers out of way but immediately at hand when needed. Saves time. Efficient. Convenient.

A Steel Sectional Device

Add compartments as required. Vertical sections 75c each. Four-compartment combination illustrated below $4.50 Indexed front and back. Write for free, instructive, illustrated folder, "How to Get Greater Desk Efficiency."

Ross-Gould Co., 318 N. 10th—St. Louis (7)
New York, Chicago, Cleveland, Philadelphia

VOGEL
PATENTED

Frost Proof Closets

350,000 giving satisfaction. Save Water; Require no Pit; Simple in the extreme. The most durable water closet made. In service winter and summer.

- Enameled Roll flushing rim bowls.
- Heavy brass valves.
- Strong hardwood seat.
- Galvanized tank.
- Malleable seat castings will not break.
- Tested under hydraulic pressure before leaving factory.

ASK YOUR JOBBER

JOSEPH A. VOGEL CO.
WILMINGTON
DELAWARE

Where Shall We Send Your Copy of "PAINT MILEAGE"

THE new Hockaday book—"Paint Mileage"—is now ready for distribution. You who are interested in painting facts should send for it. You will find "Paint Mileage" brim-full of vital painting information, prepared by a paint expert, and so interestingly presented that you will concede it to be an authority on interior painting and a reference book to which you will refer many many times.

In requesting a copy of "Paint Mileage" please be so good as to state your official connection with your organization. In "Paint Mileage" we have prepared a very complete and authoritative analysis of interior painting problems. Hence we are anxious that it shall reach the important executives most interested in interior painting facts.

THE HOCKADAY COMPANY
1823-1829 Carroll Ave. Chicago, Ill.

HOCKADAY

THE WASHABLE FINISH FOR ALL INTERIORS

Zemco-lite "The Cement Paint"

TRADE MARK

Whitest, Most Durable Mill White

FOR the walls and ceilings of your mill, there is no better mill white than "ZEMCO-LITE."

It is durable, economical, sanitary and does not discolor, crack off and fall on fabrics or machines.

It is economical, in that it is mixed with water. Oil paints are expensive, and have a tendency to turn yellow, owing to the oil used as their base.

We also have a complete line of paints for mill villages, in various attractive colors.

Our service and laboratories are at your disposal.

American Cement Paint Co., Chattanooga, Tenn.

IT goes without saying that the capacity of our Tube Mills would not have been increased during the past twenty years from 30,000 tons to 675,000 tons per year unless demand for

YOUNGSTOWN PIPE

had made such increase necessary. Nor will it be disputed that such demand could not have existed if "Youngstown" Pipe had not been, through all these years, recognized as VERY GOOD PIPE.

It is, as a matter of fact, universally regarded as being just as good pipe as can be made, even by an organization controlling its own ores, fuel, and all processes entering into production.

No extravagant claims have been made for "Youngstown" Pipe. No special processes have been heralded as the reason for its excellence. It is simply the best pipe that can be manufactured in commercial quantities. It is honestly made, honestly tested and inspected, and backed by a company eager to serve its cuttomers and secure their genuine and lasting good will.

The Youngstown Sheet & Tube Company

Youngstown, Ohio.

DISTRICT SALES OFFICES:

BOSTON—120 Franklin St.
NEW YORK—30 Church St.
PHILADELPHIA—Pennsylvania Bldg.
ATLANTA—Healey Bldg.
PITTSBURGH—Oliver Bldg.
CLEVELAND—Leader-News Bldg.
DETROIT—Dime Savings Bank Bldg.
CHICAGO—McCormick Bldg.
ST. LOUIS—1139 Olive St.
DENVER—First Nat'l Bank Bldg.
DALLAS—1401-02 Magnolia Bldg.
SAN FRANCISCO—604 Mission St.
SEATTLE—Central Bldg.

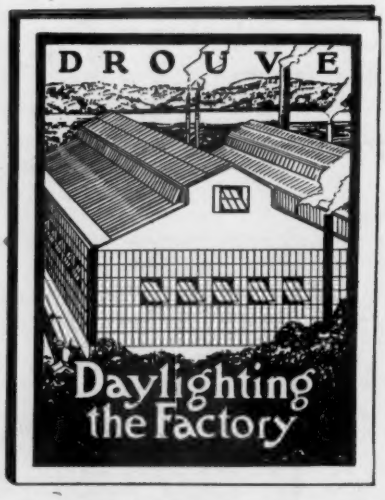
PRINTING

WE do it for some of the largest mills in the South—*Why not for yours?*

If our prices and service were not right, we could not do it.

THE A. J. SHOWALTER COMPANY

Dalton, Georgia.



Look Into It!

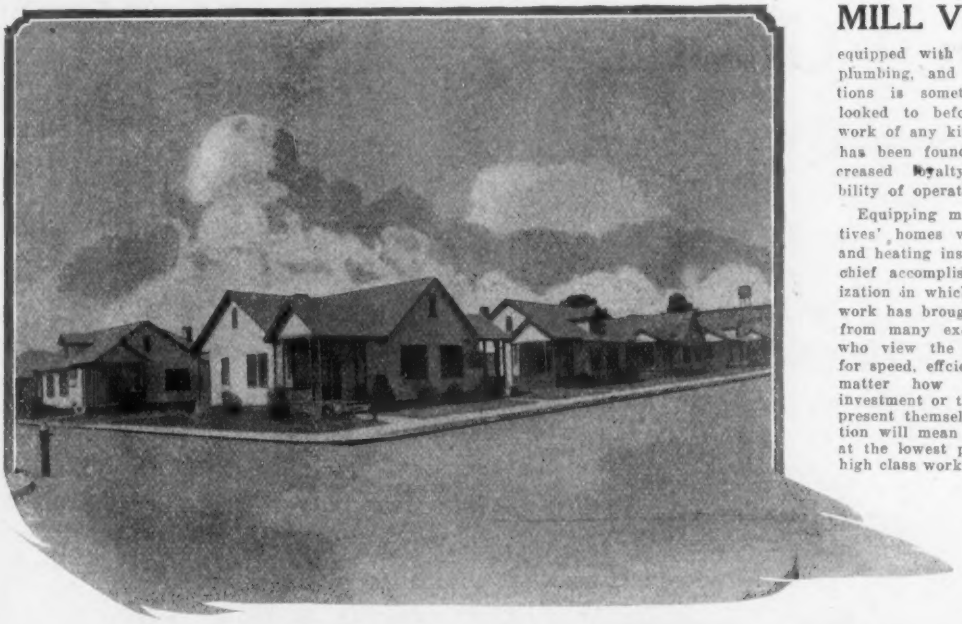
Perfect lighting of the mill interior is today, more than ever, an economic necessity, and of all lighting, natural daylight is the best and cheapest.

If you are contemplating changes in your mill, new additions or a new mill construction, look into the matter of skylights. This interesting booklet tells how skylight roofs can be made as substantial as any other roofs, how glass breakage has been eliminated and corrosion prevented, how better lighting and more perfect ventilation is assured, illustrating many installations, and containing other data of value to the mill man.

A copy should be in every mill man's file. Write for your free copy today.

THE G. DROUVE CO.

BRIDGEPORT, CONNECTICUT



MILL VILLAGES

equipped with electric lights, proper plumbing, and even heating installations is something that should be looked to before any other welfare work of any kind, and the investment has been found a paying one in increased loyalty, efficiency and stability of operatives.

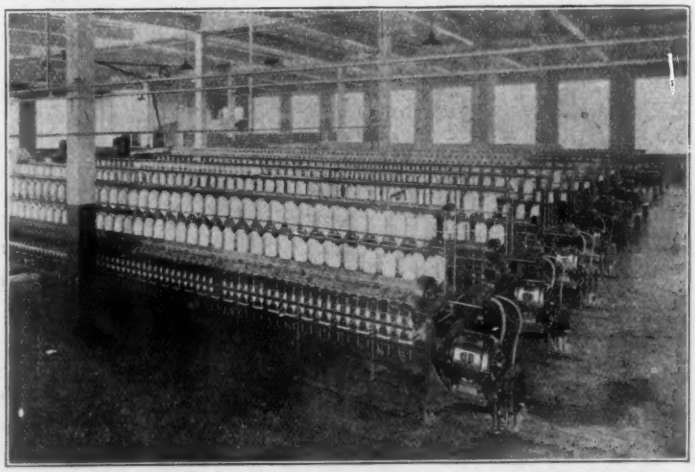
Equipping mill villages and executives' homes with electric, plumbing and heating installations is one of the chief accomplishments of this organization in which the excellence of our work has brought forth commendation from many executives and engineers who view the results as remarkable for speed, effciency and economy. No matter how small or large the investment or the difficulties that may present themselves, a Walker installation will mean permanent satisfaction at the lowest possible initial cost for high class work and equipment.

Ask for the handsome Walker book.

WALKER ELECTRIC & PLUMBING CO.
ATLANTA, GEORGIA.

Branch Offices at Convenient Points Throughout the South

Textile Motors



ALLIS-CHALMERS

Induction Motors are designed and built especially when applied to the Textile Industry. Motors are adapted for every type of drive, and are built in all sizes for all speeds.

Write for Textile Bulletin.

ALLIS-CHALMERS PRODUCTS
Electrical Machinery
Steam Turbines
Steam Engines
Gas and Oil Engines
Hydraulic Turbines
Crushing and Cement Machinery
Mining Machinery

ALLIS-CHALMERS MANUFACTURING COMPANY

MILWAUKEE, WISCONSIN. U.S.A.

ALLIS-CHALMERS PRODUCTS
Flour and Saw Mill Machinery
Power Transmission Machinery
Pumping Engines-Centrifugal Pumps
Steam and Electric Hoists
Air Compressors - Air Brakes
Agricultural Machinery
Condensers

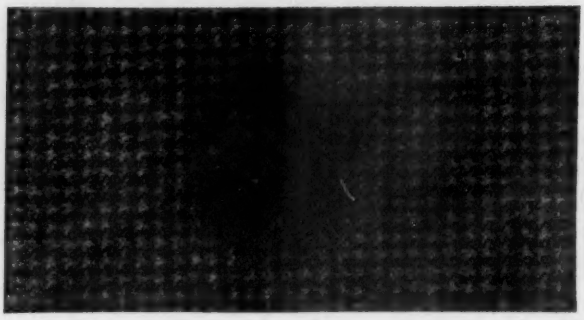
Stained Goods!

Hot Bearings mean short life.

Bearings are expensive.

Oil running out of bearings means dirty floors and machinery. RESULTS! WASTED MATERIAL FROM STAINED GOODS.

STAYSWELL laughs at drips and spatters.



STAINED GOODS ARE EASY TO AVOID BY USING THE SNOW-WHITE STAINLESS GRADES OF STAYSWELL

STAYSWELL "STAYS PUT" on the hottest bearing, eliminating all friction.

Let us quote you on your requirements.

LAMSON OIL CO., Inc.
10 Dorrance St. Wharf
PROVIDENCE, R. I.

Evener Laps—More Production!

Mr. W. C. Cobb, General Superintendent of the Ware Shoals Mfg. Co., said at the Textile Association Convention in June that ball bearings on his aprons and eveners had reduced the number of laps set back to less than one per cent.

He is getting better laps and more of them than ever before. His numbers are running better, and he has less trouble with breaking strength. You can do the same thing that he did. Order some today.

AldricH MachinE

Ball WorkS Bearings
Greenwood, S. C.

CONCRETE — DIXIE PORTLAND CEMENT CO. ROYAL CHATTANOOGA, TENN. — PERMANENT

MR. TAXPAYER—YOU!

Do you want your country to spend YOUR good money on roads that will wear out before your bonded indebtedness is liquidated?

I SAY YOU DON'T.

What you want is a hard-surfaced road, with little cost for maintenance—a road that can be traveled in rain or snow, summer and winter. You want a PERMANENT road—that means CONCRETE!

Write for Literature—It's Free

DIXIE PORTLAND CEMENT CO.
CHATTANOOGA, TENN.

BALL BEARINGS Chapman

YOU PAY FOR THEM WHETHER YOU BUY THEM OR NOT

Who Pays?

Who pays for the power that friction steals—right in your own plant?

You do! But that is because you have not become familiar with the famous CHAPMAN BALL BEARINGS.

Day after day, year in and year out, you keep on paying for power that you do not get—power that FRICTION consumes.

CHAPMAN-IZE NOW AND SAVE MONEY

Here is an investment that will save you money as long as you are a producer through the use of power—an investment that pays for itself in a couple of years. "CHAPMAN BALL BEARINGS ON ALL YOUR LINE-SHAFTING ELIMINATES FRICTION."

Fool-proof, trouble-proof, care-free are these enemies of friction—and they'll save you as much as 15% to 40% in power costs.

The saving is too great to ignore! You pay for CHAPMAN'S whether you buy them or not! Why not have them?
THEY FIT YOUR PRESENT HANGER FRAMES

Drop us a line, and we'll be glad to tell you more.

TRANSMISSION BALL BEARING COMPANY

1061 MILITARY ROAD **BUFFALO, N. Y.**

Branches: New York, Chicago, Philadelphia, Cambridge, Mass.; Toronto, Canada. Representatives in Principal Cities.

A few of thousands of plants NOW USING CHAPMANS As Standard Equipment

GILLETTE SAFETY RAZOR CO. Boston, Mass.
INTERNATIONAL MOTOR CO. Plainfield, N. J
PIERCE-ARROW MOTOR CAR CO. Buffalo, N. Y.
OSTERLEIN MACHINE CO. Cincinnati, Ohio
GOULD & EBERHARDT Newark, N. J.
BETHLEHEM STEEL CO. South Bethlehem, Pa.
FORD MOTOR CO. Walkerville, Ont.
FISHER BODY CO. Detroit, Mich.
WATERBURY MAN'F'G CO. Waterbury, Conn.
ROCK ISLAND ARSENAL Rock Island, Ill.
BAUSCH & LOMB OPTICAL CO. Rochester, N. Y.
CHICAGO PNEUMATIC TOOL CO. Franklin, Pa.
CRUCIBLE STEEL CO. Jersey City and Pittsburgh
HOOVER STEEL BALL CO. Ann Harbor, Mich.
AMERICAN EVER READY CO. Long Island City, N. Y.
NATIONAL TOOL CO. Cleveland, Ohio
SUPERIOR GAS ENGINE CO. Springfield, Ohio
VICTORIA COTTON MILLS Rock Hill, S. C.

D-A Lubricant Lowers Costs

Here is the Proof!

WOODRUFF COTTON MILLS
WOODRUFF, S. C.

D-A Lubricant Co., October 11, 1922.
Indianapolis, Ind.

Attention Mr. Louis C. Slicer.

Gentlemen:

Replying to your inquiry of the 2nd as to our experience with the D-A Lubricant would say that on June 11, 1921, we filled one of our chain-boxes with 3½ lbs. of your lubricant and it has been running ever since with no more added. We also have about 75 boxes which have been running about 3 months. We find the D-A Lubricant to be the best for this purpose that we have ever used.

Yours very truly,
WOODRUFF COTTON MILLS,
(Signed) J. N. Smith, Superintendent.

D-A is also recommended for:—
Cams, rollers, gears, slasher bearings.

Packed in steel drums—half-drums and 50-pound cans.

We give a special gun for applying with each order.

D-A lives up to all our claims, or is returnable. Send us your order on this basis—you will be well pleased.

COUPON — SIGN BELOW

D-A Lubricant Co.
Indianapolis, Ind.

Gentlemen: Please send us testing sample for.....
.....(indicate purpose) and information on D-A without obligation.

Name .....
Firm .....
City .....
State .....

DEPENDABLE-ALWAYS D-A Lubricant

"Clings to Metal"

D-A LUBRICANT CO., INC.

INDIANAPOLIS, INDIANA

Atlanta Branch
John K. Gewinner, 33 Luckie St.
Atlanta, Ga.

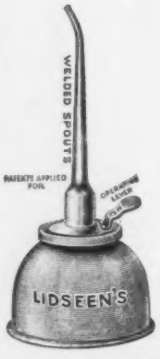
? ?

Have You Difficult Places to Oil??

Do You Want Just a Drop of Oil or More?

WELL

We can take care of your wants with the



LIDSEEN

POSITIVE FORCE FEED OILERS

Take it up with Your Jobber or with us

37 numbers of oilers to choose from ALL WELDED

LIDSEEN PRODUCTS

832-840 SO. CENTRAL AV. CHICAGO

General Electric

Distributing Jobbers

Complete lines of Wire, Switches, Safety Switches, Wiring Devices, Fuses, Edison Mazda Lamps and other electrical materials carried in our Atlanta and Savannah warehouses ready for immediate shipment.

Quick Service

Carter Electric Co.

(WHOLESALE)

21 Haynes St. Atlanta, Ga.

CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also precede merit as surely in machinery as in men.

Time, skill and effort must also precede merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

CRESSON-MORRIS COMPANY

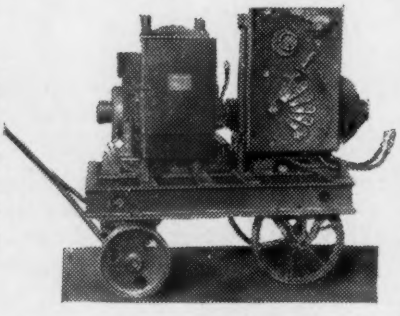
ENGINEERS—FOUNDERS—MACHINISTS

PHILADELPHIA, PENNA

Branch Office. 141 Milk St., Boston, Mass.

Did You See

The G-E Arc Welding Set



At Greenville?

Doubtless you did—if you attended the Southern Textile Exposition at Greenville, S. C.

If you did not, we shall be pleased to send you full information and illustrated literature showing the G-E ARC WELDING SET, and also our LATEST IMPROVED OXY-ACETYLENE WELDING MACHINES and supplies.

Drop us a postal.

George Bird Bruce Potts

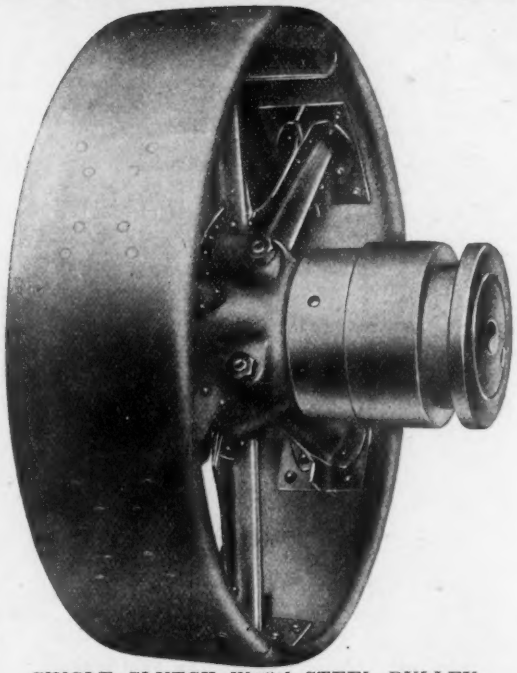
WELDING ENGINEERS

BIRD-POTTS CO.

WELDING Incorporated BUILDING

376-378 MARIETTA ST., ATLANTA, GA.

THE JOHNSON FRICTION CLUTCH



SINGLE CLUTCH WITH STEEL PULLEY MOUNTED ON HUB.

A LINE-SHAFT CLUTCH

Do you realize the saving in extra belting, pulley and hangers when driving machinery direct from line-shaft?

Then there is not the trouble with JOHNSON CLUTCHES that is experienced by the use of tight and loose pulleys on countershafts and on machinery.

"THE PROOF OF THE CLUTCH IS IN THE USE THEREOF"

We specialize in applying the proper type of Friction Clutch on any Light Powered Drive.

WRITE FOR CATALOG G.

See our Exhibit at the National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York, December 7th to 13th.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

REG. U.S. PAT. OFF. TRADE JENKINS MARK Jenkins Bros

Years of Discretion

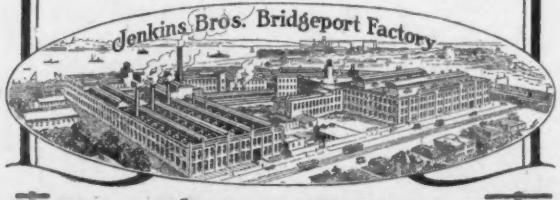
Early in their career, Jenkins Valves proved themselves to be thoroughly *good* valves. Since then they have proved themselves thoroughly *dependable* valves, by never once deviating from that standard of perfection.

Today, after fifty-eight years' experience, years of friendships made and kept, they are recognized as *the* valves of *the* dependable service.

Identified by the Jenkins Diamond Mark and signature—at supply houses everywhere.

JENKINS BROS.

New York Boston Philadelphia Chicago
Montreal London



Jenkins Valves
SINCE 1864

BETTER **NON-FLUID OIL** LUBRICATION

Head Work vs. Foot Work

The thoughtful operator saves his time and accomplishes more by using headwork to save steps. Too frequent oilings waste many steps that could be saved by the use of

TRADE MARK REGISTERED IN **NON-FLUID OIL** UNITED STATES PATENT OFFICE

Modern Textile Lubricants

NON-FLUID OIL lasts several times as long as liquid oil, saving time and labor and saving in lubricant cost, as a stated quantity outlasts liquid oil and costs less.

Another benefit to both operator and mill is the freedom from oil stains where NON-FLUID OIL is used—it won't drip, spatter or creep.

Write for Free Sample.

NEW YORK & NEW JERSEY LUBRICANT CO.
401 Broadway New York
Southern Agent, L. W. Thomason, Charlotte, N. C.
Ample Stocks at Our Branches:
Charlotte, N. C.; Greenville, S. C.;
Atlanta, Ga.; New Orleans, La.

AT LESS COST PER MONTH

"I am very well pleased with the machine recently purchased; so much so that I have placed an order for a second machine. This new machine will cut up to 4 inches. It is possible that later I will buy another 4-inch and another 6-inch".
A Philadelphia user

OSTER
BELT and MOTOR

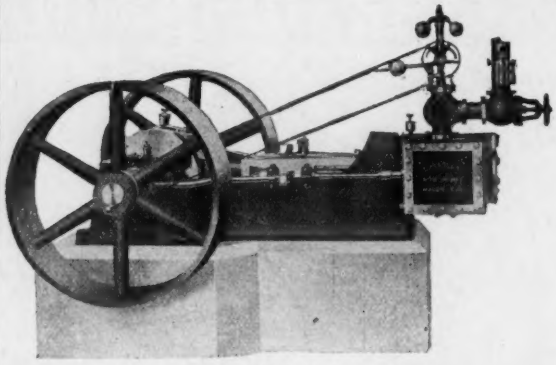
COMBINATION THREADING MACHINES
STRAIGHT PIPE • BENT PIPE • NIPPLES • BOLTS

4 days' work a month for this machine is sufficient to make it show handsome dividends over hand-threading. So simple that a boy can operate it, it takes care of the rush repeat job or the extensive installation in the speediest, easiest way. And in between it reclaims scrap pipe into valuable nipples. Write for *"Pipe-Threading Profits"*, 16 pages of users' testimony.

THE OSTER MFG. CO.
Specialists in Hand and Power Threading Equipment
2061 East 61st Place Cleveland, Ohio

"The 300-A machine which we purchased 12 years ago and which has been in almost continuous operation is still proving very satisfactory and running continually."
A Hamilton, O., user

"We believe your 306-A machine is the best outfit made. Ours has been in use 3 years and we figure it has paid for itself four times over. We'll be glad to demonstrate it."
From Charleston, S. C.

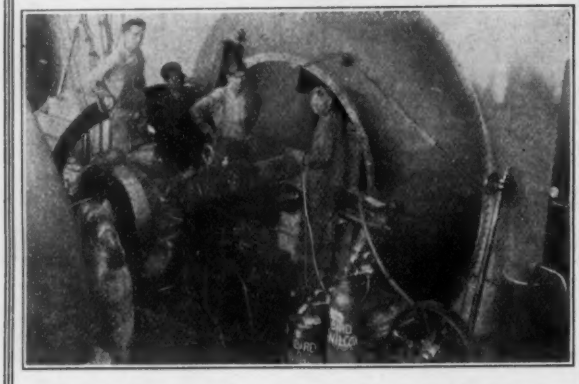


J. S. Schofield's Sons Co.
Macon, Georgia

MANUFACTURERS OF

High Pressure Return Tubular Boilers, High Grade Stationary Steam Engines, Tanks, Stacks, Stand Pipes.

Heavy Castings and Wrought Iron Works.



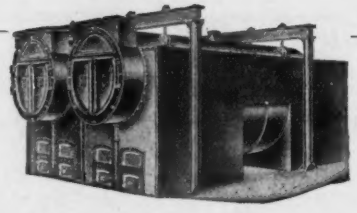
Welding vs. New Parts

Just stop to consider the great economy of welding instead of buying new parts.
In the illustration pictured above is shown a typical example of the great saving effected through the use of

Standard Welding and Cutting Service

The shaft that connected this big water turbine with the electric generator became worn at the stuffing box, the shaft was 19 feet long and 12 inches in diameter and became worn ¾ of an inch in depth and about 9 inches long.
The question was whether they should get a new shaft which at that time would have cost them about $5,000 in addition to the cost of labor and transportation, or whether they should have the worn places built up.
They called upon us. It required only ten days to put this shaft in first-class condition, and at a cost of about $200.
Such savings can be effected in your mill. Let us tell you about STANDARD SERVICE as well as Standard Welding and Cutting Machines, oxygen and supplies.
Full information is yours for the asking.

Standard Gas Products Co., Inc.
ATLANTA, GA.



The Result of a Quarter Century Experience

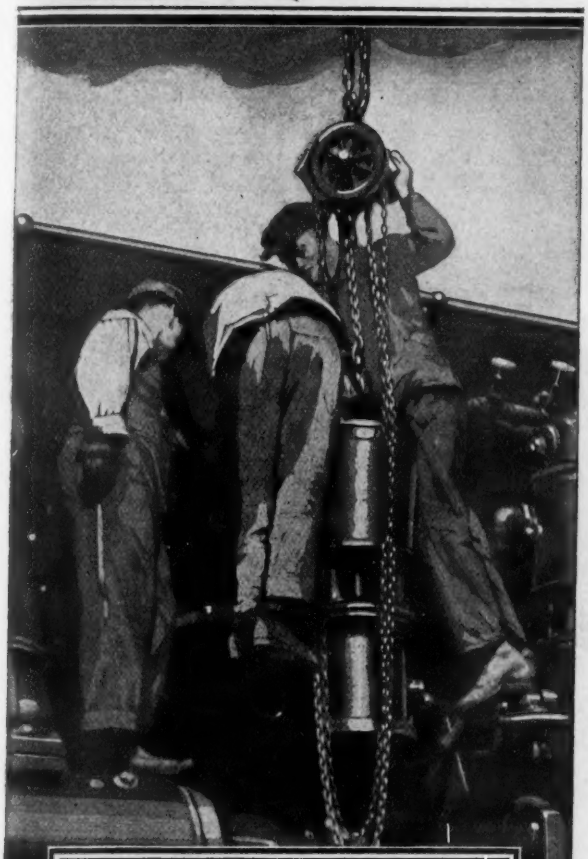
These years of experience and study together with exhaustive tests and improvements, has enabled us to build modern boilers that are second to none—in design, construction, high efficiency and capacity, economical operation, and low cost for upkeep.

Made in several types. Write us today and let us send you full data and reasons why the W & W BOILER will best meet your requirements.

The Walsh & Weidner Boiler Co.
CHATTANOOGA, TENN.

WALSH & WEIDNER
TUBULAR WATER TUBE **BOILERS**

CYCLONE HOISTS
HIGH SPEED



for Hurry-Up Jobs

THE incident pictured above is typical of the hurry-up jobs handled daily by Cyclones. This big locomotive was wanted for the Lehigh Valley Black Diamond Express. The air pump was discovered to be out of order. Quick work by the mechanics, fast, deft lifting by the Cyclone and the running board was dismounted, the old compressor taken out, a new compressor put in its place and the running board replaced—all in less than an hour. The Black Diamond Express pulled out on time!

Good mechanics and Cyclone Hoists make a great team in all lines of industry.

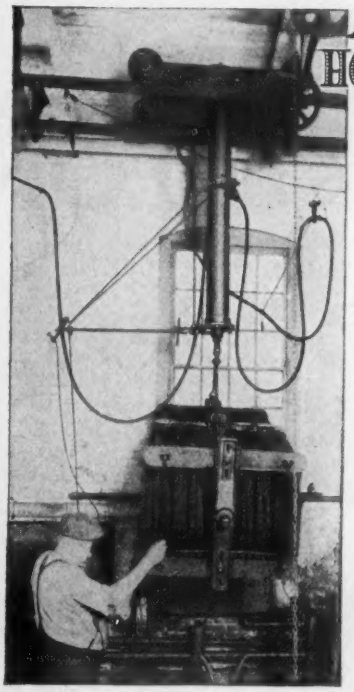
We have capable distributors in all localities to aid you in laying out material-handling and hoisting systems and submit estimates. Catalog on request.

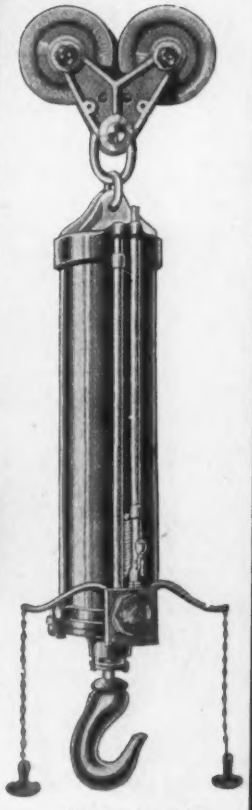
The Chisholm-Moore Mfg. Co.
Cleveland, O.

Hoists Cranes Trolleys

Branches: New York Chicago Pittsburgh

CURTIS
AIR HOISTS





Used in The Textile Industry

"Lift it with air"

Curtis one man All Steel Air Hoists and Curtis Roller Bearing Trolleys are effecting important economies in leading textile mills throughout the country.

Why not install a Curtis Air Hoist and operate it with the air you now have available? The wide variety of uses to which Curtis equipment can be most economically applied is worthy of your immediate investigation.

Curtis Pneumatic Machinery Co.
1571 Kienlin Ave. St. Louis, Mo.
Branch Office
532-R Hudson Terminal New York

CURTIS
AIR COMPRESSORS-HOISTS-TROLLEYS-CRANES
ST. LOUIS
C.P.M.Co.

Established 1854

Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Banks, Etc.

The Recognized Standards of Quality

COTTON YARNS

Gray Manufacturing Co.
Arrow Mills, Inc.
Parkdale Mills, Inc.
Flint Manufacturing Co.
Arkray Mills, Inc.
Arlington Cotton Mills
Myrtle Mills, Inc.

Our Fine Yarns Make Fine Fabrics

The manufacturers of a number of America's well known textile products can vouch for the strength, uniformity, cleanliness and better weaving and knitting qualities of our yarns.

The yarns we spin for knitting, weaving, laces and converting, are furnished in all twists on skeins, cones, tubes and warps:

30s to 80s Single and Ply Combed Peeler Right Twist. 30's to 50's Single and Ply Double Carded Peeler, Right or Reverse Twist.

20s to 60s, 2, 3, and 4 Ply, Combed Peeler, Reverse Twist.

Our products are sold direct and exclusively through our General Sales Offices:
225 Fifth Avenue at 26th Street,
New York.
H. A. FLORSHEIM, Sales Manager
Long Distance Phone:
Madison Sq. 7666-7-8 and 9.

BRANCH OFFICES { Boston, Philadelphia, Chicago

GRAY DAWN QUALITY YARNS Gray Manufacturing Co. Gastonia, N.C.

ARROW MILLS COMBED YARNS GASTONIA, N.C.

MYRTLE MILLS INC. COTTON YARNS GASTONIA, N.C.

PARKDALE MILLS, Inc. PARKDALE YARNS ARE THE BEST GASTONIA, N.C.

ARLINGTON COTTON MILLS COTTON YARNS GASTONIA, N.C.

ARKRAY MILLS FINE COMBED GASTONIA, N.C.

FLINT MFG. CO. TRADE MARK FLINT GASTONIA, N.C.

Weimar Bros.

Phone Connections
Works, 2046-48 Amber Street,
PHILADELPHIA, PA.

MANUFACTURERS OF

Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

WOODWARD, BALDWIN & CO.

DRY GOODS

Commission Merchants

43-45 WORTH STREET, NEW YORK

CARVER-BEAVER YARN CO.

Successors to A. D. SALKELD & BRO., Inc.

ALL NUMBERS COTTON MERINO **YARNS** ALL COLORS WOOL WORSTED

366 BROADWAY, NEW YORK

STENCILS

FOR COTTON SHIPPERS, COTTON MILLS, MERCHANTS & MANUFACTURERS - ALSO BRUSHES, INK, MARKING POTS

RUBBER STAMPS, NOTARIAL & CORPORATION SEALS

ATLANTA RUBBER STAMP & STENCIL WORKS

OFFICE: 33 LUCKIE ST. WORKS: 350 EDGEWOOD AVE.

P.O. BOX 633 — QUICKEST STENCIL AND STAMP HOUSE IN GEORGIA — ATLANTA, GA

Callaway Mills

INCORPORATED

345 Madison Avenue

Phone—Murray Hill 7801

NEW YORK

SELLING AGENTS
Unity Cotton Mills
Milstead Manufacturing Co.
Elm City Cotton Mills
Manchester Cotton Mills
Hillside Cotton Mills
Unity Spinning Mills
Villa Rica Cotton Mills

Boston Representative
M. R. ABBOTT
110 Summer Street

Chicago Representative
RAY T. JOHNSON
226 W. Adams Street

—SILK—
Oscar Heineman Co.
CHICAGO

SINGLE MERCERIZED
—YARNS—
Southern Mercerizing Co.

SOUTHERN YARN CO.

911 JAMES BUILDING, CHATTANOOGA, TENN.

—SINGLES AND PLY YARNS
OF EVERY DESCRIPTION
DIRECT FROM SPINNERS—

HUGHES FAWCETT

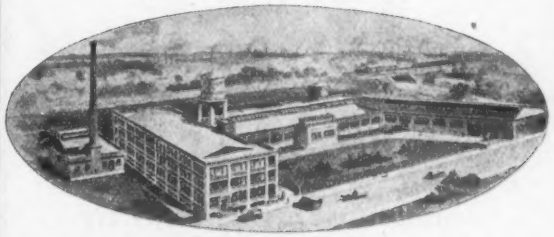
IMPORTER AND COMMISSION MERCHANT

LINEN YARNS
For Weaving, Knitting and all Purposes.

TURKEY RED YARNS
For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine
And Every Description of Linen Thread and Twine

115 Franklin Street, : NEW YORK



View of our Mercerizing and Bleaching Plant

BOGER & CRAWFORD

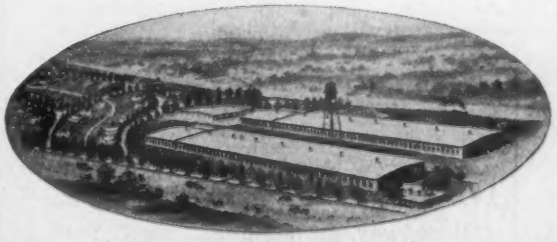
Established 1908

Spinners, Bleachers, Dyers
and Mercerizers of High
Grade Combed Yarns

By using our Spinning and
Mercerizing you are always
assured of a standard pro-
duct

*"From the Cotton Field
Direct to You"*

Main Office, Factory and Warehouse
J and East Venango Sts., PHILADELPHIA



Spinning Mills, Lincolnton, N. C.

Hotel Sinton

Known by travelers for its unusually large and well-ventilated rooms

CINCINNATI

700 ROOMS 700 BATHS 700 SERVIDORS

MODERATE TARIFFS

Write for Booklet on Cincinnati and The Hotel Sinton. We will also send Mail Order price list of the Famous Hotel Sinton Louis XVI Candies.

HOTEL SINTON Management of John L. Horgan CINCINNATI

EUROPEAN PLAN

Rooms 600 Baths

Headquarters in Detroit for

OLD COLONY CLUB
DETROIT AUTOMOBILE CLUB

. . DAILY RATES . .

100 at $2.50 Single—$4.50 Double
150 " $3.00 " —$5.00 "
100 " $4.00 " —$6.00 "
50 " $5.00 " —$7.00 "
50 with Twin Beds, $5.00 to $7.00
100 In Suite, $5.00 to $8.00, Double
Two Floors of Agents' Sample Rooms $5.00 per Day
Table d'Hote Dinner, $1.25-$2.00

HOTEL TULLER

Under New Management
CAFETERIA O. C. FROMAN, Mgr. GRILLE
Business Men's Lunch 65c.

A Matter of Economy

The MARTINIQUE

IS GLAD TO ANNOUNCE
REDUCED RATES

SOMEONE must take the initiative in making it possible for people to travel and spend less money—now that there is less money to spend.

So, hand in hand with Hotel McAlpin which recently announced its reductions, the Martinique—just across the street and under the same management—becomes a leader in lowering hotel tariff.

This is setting an advance style, as it were, for there has not been an appreciable reduction in the cost of running a large New York hotel.

If, however, the public esteems the spirit in which it is done, as much as the management of the McAlpin and Martinique appreciates its patronage, then indeed, is it worth doing.

At the Martinique the new prices are: $3.50 up for rooms and bath; $2.50 for room without bath.

The MARTINIQUE

Broadway, at 32nd St., New York
Frank E. Jago, Resident Manager

ATLANTA'S NEW MILLION DOLLAR HOTEL
POPULAR PRICED

HOTEL CECIL

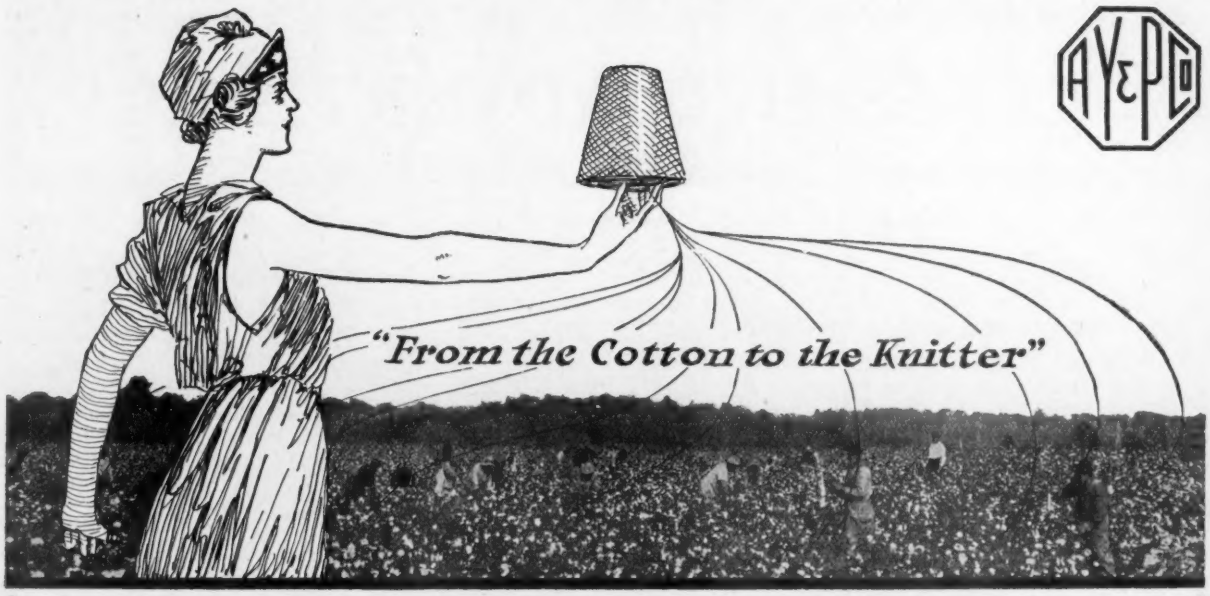
COFFEE SHOP—ROOF GARDEN

312 ROOMS—FIRE PROOF—312 BATHS
RATES PER DAY, EUROPEAN PLAN

	ONE PERSON	TWO PERSONS
22 ROOMS AND BATH	$1.50	
104 ROOMS AND BATH	2.00	$3.00
104 ROOMS AND BATH	2.50	4.00
53 ROOMS AND BATH	3.00	5.00
14 ROOMS AND BATH	4.00	6.00
8 ROOMS AND BATH TWIN BEDS		5.00
7 ROOMS AND BATH TWIN BEDS		7.00

H. R. and C. R. CANNON, Proprietors
J. F. deJARNETTE, Manager

OPERATING
GEORGIAN HOTEL ATHENS, GA. TERMINAL HOTEL ATLANTA, GA.



AMERICAN YARN & PROCESSING CO.

MOUNT HOLLY, N. C.

SPINNERS AND MERCERIZERS

HIGH GRADE COMBED AND CARDED YARNS—16s to 80s

Our Mercerized Yarns Are the Product of Our Own Mills

General Office, Mt. Holly, N. C. Branch Office, 1111 James Bldg., Chattanooga, Tenn.

Representatives

H. B. ROBIE, 346 Broadway, New York City FORREST BROS., Forrest Bldg., Philadelphia

The American Audit Co.

F. W. LAFRENTZ, C. P. A., Pres.
H. M. RICE, C. P. A., Vice-Pres. A. F. LAFRENTZ, Secy. & Treas.

NEW YORK—100 Broadway (Home Office).
33rd St. and 5th Ave., (Waldorf-Astoria).
ATLANTA BRANCH—1013-1017 4th National Bank Bldg.
CHICAGO—Marquette Building.
BOSTON—P. O. Square Bldg.
PHILADELPHIA—Colonial Trust Bldg.
BALTIMORE—Garrett Bldg.
WASHINGTON, D. C.—Colorado Bldg.
NEW ORLEANS—Maison Blanche.
RICHMOND, VA.—American National Bank Building.
MILWAUKEE—Loan & Trust Bldg.
SCRANTON—County Bank Bldg.
WILKES BARRE, PA.—Odd Fellows Bldg.
LOS ANGELES, CAL.—Herman W. Hellman Bldg.
KNOXVILLE, TENN.—American National Bank Bldg.
LONDON, E. C.—50 Gresham St., Bank.

Specialties in Cost Systems and Manufacturing Accounts.

ATLANTA BRANCH

C. B. BIDWELL, C. P. A., Resident Vice.President

COTTON MILL REPAIRS

SEND SAMPLES OF PARTS WANTED AND GET OUR PRICES. YOU DON'T HAVE TO BUY.

WE WILL SAVE YOU TIME

AND WON'T EXPECT YOUR ORDER IF WE CAN'T

SAVE YOU SOME MONEY TOO

Briggs-Shaffner Company

WINSTON-SALEM, N. C.

MACHINE WORK FOUNDRY WORK

ESTABLISHED 1872

H. & B. BEER

NEW ORLEANS

HENRY BEER EDGAR H. BRIGHT

J. WILLIAM BARKDULL C. MORGAN ABRAMS

MEMBERS OF

New Orleans Cotton Exchange
New Orleans Future Brokers Association
New York Stock Exchange
New York Cotton Exchange
New York Coffee Exchange
New York Produce Exchange
Chicago Board of Trade

Associate Members of the Liverpool Cotton Association

Private Wires to Principal Points

CLASSIFIED ADVERTISING

RATES:

DISPLAYED.

"For Sale" and all other advertisements using bold-face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(When replies are to be received in our care, allow four words for box address.)

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,

127-31 N. Third St.

Philadelphia, - Pennsylvania

POSITION WANTED

The advertiser is a master mechanic of many years' experience in all the branches of textile machinery, as well as in building and equipping mills from the draughting board to the complete mill; holds first-class steam engineers' license and is fully conversant with all steam, electric and hydraulic powers their maintenance and successful operation ;a graduate in the economy of fuel and its conservation. Will be open for engagement December first or sooner.

Address M. M., care COTTON, Atlanta, Ga.

WANTED—One or two accounts of lines selling to Textile Mills by an organization with three salesmen covering Southern Mills. Commission basis. Address Box 58, care COTTON, Atlanta, Ga.

EXECUTIVE'S EMPLOYMENT AGENCY

WANTED: Superintendents, secretaries, bookkeepers, stenographers, overseers, who are out of employment, or either desire more suitable connections to communicate with us. In the last few days we have placed 27 practical men in better positions. Our services dignified and confidential.

Executives' Employment Agency, Charlotte, N. C.

FOR SALE

A 4-story brick mill 100 x 50 feet with a 100 x 26-foot picker room and stock house attached, situated in Rhode Island. The property includes nine tenements, a large boarding house and nineteen acres of land. Also a first-class water privilege with a 75 h.p. wheel. Fitted up to make coarse cotton yarns, 10s to 20s. Now running on No. 10. For further particulars write or call on

G. B. LANGWORTHY,
Westerly, R. I.

Salesmen Wanted

The Cellugraph Engineering Corporation is prepared to take on a few salesmen located in manufacturing centers of the United States. The product of the corporation is a self-lubricating bearing already proven satisfactory in many thousand installations. Address C. H. Fish, General Manager, 73 Tremont Street, Boston, Mass.

FOR SALE

Hosiery Mill fully equipped for making and finishing 300 dozen 136 needle Men's Seamless Half Hose per day. Property covers several acres; includes modern mill building 40 x 140 ft., two warehouses and 7 operatives' cottages. Steam heated and electric run. Labor plentiful and power cheap.

Will sell machinery and buildings separately if desired. Building excellent for manufacturing establishment of any kind.

Will sell cheap if taken at once.

TALLADEGA KNITTING MILLS
Talladega, Ala.

NEW ENGLAND MANUFACTURERS, whose product is a necessity in every Cotton, Silk, and Worsted Mill, recognized as an A-1 installation for many years are desirous of making a mutually satisfactory selling arrangement for entire Southern territory.

Individual sales range from a minimum of One Thousand Dollars up to Twenty Thousand Dollars, and in many cases more than the latter.

This matter will prove to be of considerable interest to the man of right calibre.

Address

Box 60

care of COTTON, Atlanta, Ga.

MACHINERY BARGAINS

for Textile Mills

The Nashville Industrial Corporation, purchasers of the $87,000,000 Old Hickory Powder Plant, has released a large amount of machinery for immediate sale, a large portion of which is very desirable for use in textile plants. None of this equipment was in use over 90 days, and while in practically new condition it is offered at second-hand prices.

Special Bulletins covering various kinds of equipment will be sent on request.

A few of the many offerings:

PUMPS.

8—14-in. Worthington Class B, double suction, 8500 G.P.M. at 152 ft. head, at 1170 R.P.M., direct connected to 300 hp. G.E., 3 phase, 60 cycle, 2200 volt motors.

4—14-in. Allis-Chalmers, Type S, 7500 G.P.M. at 130 ft. heat at 1760 R.P.M., direct connected to 300 h.p. General Electric, 3 phase, 60 cycle, 2200 volt motors.

2—10-in. Allis-Chalmers, Type S, 3750 G.P.M. at 130-ft. head at 1765 R.P.M., direct connected to 150 h.p. Westinghouse 3 phase, 60 cycle, 2200 volt motors.

6—16-in. Allis-Chalmers, Type S, 8500 G.P.M. at 90-ft. head, direct connected to Type L, 300 h.p., 2000 R.P.M. G.E. Curtis steam turbine.

6—14-in. Allis-Chalmers, Type S, 6500 G.P.M. at 150-ft. head, 8100 G.P.M. at 90-ft. head, direct connected to 300 h.p. 2000 R.P.M. G.E. Curtis steam turbine.

1—20 x 12 x 16 Worthington duplex Underwriters fire pump, 1500 G.P.M., 100 lb. pressure.

200—New and used simplex and duplex, steam driven, Worthington pumps, 4½x3¾x4, 5½x4¾x5, 6x4x6, 7½x4½x10, 6x2½x6.

100—New and used belted 2½", 3", 5", 5", and 6" centrifugal pumps.

Bulletin No. 8 gives complete specifications of all Pumps.

BLOWERS.

2—18-in. Type C. American Electric Exhaust Fans.
10—18-in Buffalo Electric Disc Exhaust Fans.
6—24-in. Buffalo Electric Disc Exhaust Fans, Emerson Motors.
28—24-in. Buffalo Electric Disc Exhaust Fans, E. S. C. Motors.
64—30-in. Buffalo Electric Disc Exhaust Fans, Emerson Motors.
18—30-in. Buffalo Electric Exhaust Fans, Sprague Motors.
5—No. 1 Buffalo Baby Conoidal Fans, Emerson Motors.
4—No. 2 Buffalo Baby Conoidal Fans, Emerson Motors.
4—No. 3 Buffalo Baby Conoidal Fans, Emerson Motors.
15—No. 4 Buffalo Baby Conoidal Fans, Emerson Motors.
All the above equipped with standard A.C. Motors.

BLOWERS—continued.

5—No. 3 Buffalo Niagara Conoidal Fans.
10—No. 4½ Buffalo Niagara Conoidal Fans.
25—No. 6 Buffalo Niagara Conoidal Fans.
15—No. 7 Buffalo Niagara Conoidal Fans.
1—No. 9 Buffalo Niagara Conoidal Fan.
10—No. 4 Buffalo "B" Volume Blowers.
5—No. 5 Buffalo "B" Volume Blowers.
2—No. 6 Buffalo "B" Volume Blowers.
5—No. 8 Buffalo "B" Volume Blowers.
10—No. 1 Low Pressure Gas Exhausters.
10—30-in. Buffalo Standard Reversible Mill Exhausters.
25—50-in. Buffalo Standard Reversible Mill Exhausters.
10—No. 4 24-in. Buffalo Steel Pressure Blowers.
7—Roots Style D, High Pressure Type Blowers, capacity 890 cu. ft. per minute.
2—Connersville Blowers, capacity 3,200 cu. ft. per minute.
Write for Bulletin No. 11 giving complete specifications.

TRANSMISSION.

Thousands of pulleys, including pressed steel, split cast iron and solid cast iron, ranging in diameter from 6 to 56 inches, and in width from 2 to 32 inches, are included with the material at Old Hickory.

Also hundreds of tons of cold rolled shafting up to six inches in diameter, pillow blocks, drop hangers, ring-oiling, capillary and standard bearings, flange couplings, ribbed couplings, grim death couplings, wall brackets, floor stands, pillow block frames, friction clutches, cut-off couplings, sleeves, collars, etc.

We can supply complete line shafts or any transmission equipment needed. Write for Bulletin No. 15.

TANKS.

1500—New and used steel Tanks, small sizes. Mixing tanks, storage tanks, boiling tanks, pressure tanks, and open tanks.
2000—Wood tanks. All sizes.
Hydro-Extractors, Cotton Washers and Dryers, Mixing Pickers, Rinsers, etc.
Electrical Supplies of all kinds.

Write for Catalogues.

NASHVILLE INDUSTRIAL CORPORATION

JACKSONVILLE, TENN.

Buyers' Index

ACETYLENE GAS.
Commercial Acetylene Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

ACETYLENE WELDING APPARATUS.
(See Welding Apparatus.)

ACIDS.
(See Dyestuffs and Chemicals.)

ACCOUNTANTS.
American Audit Co.
Ernst & Ernst.

ACCOUNTING SYSTEMS.
Ernst & Ernst.

ADDING MACHINES.
Monroe Calc. Mch. Co.

ADHESIVES.
Stein, Hall & Co.

AERATING AND CLEANING MACHINE.
Murray Company, The.

AIR WASHERS.
Bayley Mfg. Co.
Buckeye Blower Co.
Carrier Eng. Corp.
Grinnell Co.
Parks-Cramer Co.

AIR COMPRESSORS.
(See Compressors.)

AIR CONDITIONING SYSTEMS.
(See Humidifying Apparatus.)

ALBONE.
Roessler & Hasslacher Chemical Co.

ALKALIES.
(See Dyestuffs and Chemicals.)

ALUM.
(See Fnishing and Sizing Materials.)

ANILINE COLORS.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE ACID GENERATOR.
Macomb Machine Co.

APRONS—RUB.
Bond Co., Chas.
Smith & Furbush Machine Co.

ARCHITECTS AND ENGINEERS.
Robert & Co.
Sirrine, J. E.
Stuhrman, Edw. A.
Thompson & Binger, Inc.

ARTWORK.
Jacobs & Co.

ASBESTOS MACHINERY.
Davis & Furber Mch. Co.

ASH HANDLING MACHINERY.
(See Coal Handling Machinery.)

ASPHALT SLATE SHINGLES.
(See Slate Asphalt Roofing.)

ASPIRATORS.
Belger Co.

AUDITORS AND ACCOUNTANTS.
American Audit Co.
Ernst & Ernst.

AUTO TRUCKS.
(See Trucks—Auto.)

AUTOMATIC CONTROLLERS (TEMPERATURE).
(See Temperature Controllers.)

AUTOMATIC LOOM ATTACHMENTS.
(See Loom Attachments.)

AUTOMATIC FEEDS FOR COTTON.
Brooks & Doxey, Ltd.
Lord Bros.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Saco Lowell Shops.
Sargent's Sons Corp., C. G.
Smith & Furbush Mch. Co.
Whitin Mch. Works.

AUTOMATIC GUIDER (ELECTRIC).
Blake Electric Mfg. Co.

AUTOMATIC SCALES.
(See Scales.)

AUTOMOBILES.
White Co.

BACKWASHERS.
Sargent's Sons Corp., C. G.

BAROMETERS.
Taylor Instrument Co.

BALL BEARINGS.
Aldrich Mch. Works
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co
U. S. Ball Bearing Co.

BALL BEARING HOUSINGS.
Aldrich Mch. Works
Fafnir Bearing Co.
Transmission Ball Bearing Co
U. S. Ball Bearing Co.

BALE BAND BUCKLES.
(See Box Strapping & Buckles.)

BALE OPENERS.
(See Openers.)

BALING MACHINES.
Brooks & Doxey, Ltd.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Lord Bros.
Rex Eng'g Corp.
Saco-Lowell Shops.

BALING PRESSES
(See Presses.)

BANDAGES, TAPES, ETC.
American Textile Banding Co.
Weimar Bros.

BANDAGE & TAPE MACHINES
Davis & Furber Mch. Co.

BANDS.
(See Tapes.)

BANKS.
Citizens & Southern Bank.
National Shawmut Bank

BARRELS—FIBRE.
(See Fibre Products.)

BASKETS—MILL.
(See Boxes—Mill.)

BATH CABINET—SHOWER.
Crane Co.
Sanymetal Products Co.

BATTERIES (ELEC.)
(See Storage Batteries.)

BEAMS.
Allen Co.
Mossberg Pressed Steel Corp.
U. S. Bobbin & Shuttle Co.

BEAM DYEING MACHINES.
Brandwood, John

BEAM HEADS.
Allen Co.
Jordan Mfg. Co.
Mossberg Pressed Steel Corp.
U. S. Bobbin & Shuttle Co.

BEAMING AND WARPING MACHINERY.
(See Warpers and Warping Machinery.)

BEARINGS.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co
Renold, Inc., Hans.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co
U. S. Ball Bearing Co.
Wood's Sons Co., T. B.

BELTING (LEATHER, CANVAS AND RUBBER).
American Supply Co.
Bond Co., Chas.
Williams & Sons, I. B.

BELTING—CHAIN.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.

BELTING (ROUND—LEATHER).
Bond Co., Chas.

BELTING—ROPE.
(See Rope Transmission.)

BELT CONVEYORS.
Brown Co., A. & F.
Dodge Sales & Eng. Co.
Link-Belt Company.
Morse Chain Co.

BELT DRESSING.
Bond Co., Chas.
Dixon Crucible Co., Jos.
Williams & Sons, I. B.

BELT FASTENERS.
Flexible Steel Lacing Co.

BELT LACING.
Bond Co., Chas.
Flexible Steel Lacing Co.
Williams & Sons, I. B.

BELT TIGHTENERS.
Brown Co., A. & F.
Link-Belt Company
Wood's Sons Co., T. B.

BENCH DRAWERS.
Lupton's Sons Co., David.

BENCH LEGS (PRESSED STEEL).
Lupton's Sons Co., David.

BENCHES (PARK AND PLAYGROUND).
(See Playground Equipment.)

BLEACHERIES.
(See Dyers, Bleachers and Finishers.)

BLEACHING KIERS.
Butterworth & Sons Co., H. W.
Hauser-Stander Tank Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machry. Co.
Woolford Wood Tank Co., G.

BLEACHING MACHINERY.
(See Dyeing, Bleaching and Finishing Machinery.)

BLEACHING, FINISHING AND SIZING MATERIALS.
(See Finishing Materials.)

BLOWERS AND BLOWER SYSTEMS
Bayley Mfg. Co.
Buckeye Blower Co.
Carlisle & Gale Co.
Carrier Eng. Corp.
Clements Mfg. Co.
General Electric Co.
Philadelphia Drying Mchry. Co.
Westinghouse Elec. & Mfg. Co.

BOARDS—FIBRE.
Keystone Fibre Co.

BOARDS—FORM.
Pearson, Jos. T.

BOBBINS.
Draper Corporation.
Jordan Mfg. Co.
Lestershire Spool & Bobbin Co.
Parker Co., Walter S.
Shambow Shuttle Co.
Vermont Spool & Bobbin Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Works.

BOBBIN HEADS.
Allen Co.
Jordan Mfg. Co.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

BOBBIN STRIPPERS.
Crompton & Knowles Loom Works.

BOILERS.
Cole Mfg. Co., R. D.
International Engineering Wks., Inc.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Toomey, Frank
Walsh & Weidner Boiler Co.

BOILER COMPOUNDS.
Dixon Crucible Co., Jos.

BOILER FEED WATER PURIFICATION.
American Water Softener Co
Norwood Engineering Co.
Scaife & Sons, Wm. B.

BOILER ROOM FITTINGS AND SUPPLIES.
Crane Co.
Dixon Crucible Co., Jos.
International Engineering Co.
Jenkins Bros.
Lunkenheimer Co.
Nashville Industrial Corp.
Oster Mfg. Co.

BOILER GRATES AND STOKERS.
(See Grates and Stokers.)

BOOKKEEPING MACHINES.
Monroe Calc. Mch. Co.

BOX STRAPPING AND TIE BUCKLES.
(See Banding Straps and Buckles.)

BOXES—MILL.
Hightower Box & Tank Co.
Keystone Fibre Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Standard Fibre Co.
Walke Box Co.

BOXES—PACKING.
(See Packing Boxes.)

BRAID.
(See Tapes.)

BRAZING.
(See Welding.)

BRICK (PAVING AND FLOOR).
National Paving Brick Co.

BROKERS—COTTON.
(See Cotton Dealers & Brokers.)

BROKERS—STOCK.
(See Stocks and Bonds.)

BROOMS.
(See Brushes.)

BROOMS—REFILLABLE.
Re-Fil-It Broom Mfg. Co.

BRUSHES—MILL.
Atlanta Brush Co.
Re-Fil-It Broom Mfg. Co.
Southwestern Broom Mfg. Co.

BRUSHES—MOTOR AND GENERATOR (COMMUTATOR).
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

BUCKETS AND PAILS—MILL.
Standard Fibre Co.

BUCKETS—ELEVATOR AND GRAB.
Link-Belt Company

BUCKLES—COTTON TIE.
(See Box Strapping and Ties.)

BUILDING CONTRACTORS.
(See Contractors.)

BUILDINGS (ALL STEEL).
Truscon Steel Co.

BUILDING MATERIAL.
Anchor Post Iron Works.
Barrett Co., The
Birmingham Slag Co.
Dixie Portland Cement Co.
Drouve Co., G.
Dufur & Co.
Hough Shade Corp.
Lupton's Sons Co., David.
National Paving Brick Co.
Sanymetal Products Co.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.
Truscon Steel Co.
Walker Electric & Plb. Co.
Ware Paint Co.

BURR PICKERS.
Davis & Furber Mch. Co.
Sargent's Sons, C. G.
Smith & Furbush Machine Co.

BUSHINGS.
Brown Co., A. & F.
Dodge Sales & Eng. Co.
Southern Spindle & Flyer Co.

BUSINESS METHODS.
Ernst & Ernst.

CABINETS.
(See Lockers.)

CALCULATING MACHINES.
Monroe Calculating Mch. Co.

CALENDERS.
Butterworth & Sons Co., H. W.
Textile Finishing Mchry. Co.

CALENDER ROLLS.
(See Rolls—Calender.)

CALLING SYSTEM—INTER-TELEPHONE.
Carter Electric Co.

CAMLESS DETACHING DEVICES.
Belger Co.

CANS—ROVING.
Keystone Fibre Co.
Standard Fibre Co.

CARS AND TRUCKS—FIBRE.
(See Trucks.)

CARBONIZING MACHINES.
Grinnell Co.
Klauder-Weldon Dyeing Machine Co.
Macomb Machine Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons & Co., C. G.
Textile Finishing Mchry. Co.
Tolhurst Mch. Works.

CARDING MACHINERY AND SUPPLIES.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Howard & Bullough.
Howard Bros. Mfg. Co.
Lord Bros.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

CARDS—HAND STRIPPING.
Howard Bros. Mfg. Co.

CARD CLOTHING.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Howard Bros. Mfg. Co.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

CARD FEEDS.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Lord Bros.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Co.

CARD GRINDING MACHINERY
Roy & Son Co., B. S.
Smith & Furbush Mach. Co.
Whitin Machine Works.

CARPET MACHINERY.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.
Textile Finishing Mchry. Co.

CARRIER APRONS.
(See Aprons.)

CARRIER SYSTEM.
Curtis Pneumatic Machinery Co.

CASES—WOODEN.
(See Boxes.)

CASTINGS.
Briggs, Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

CAUSTIC SODA.
(See Bleaching Materials.)

CEMENT.
Dixie Portland Cement Co.

CEMENT REINFORCEMENT.
Birmingham Slag Co.
Truscon Steel Co.

CEMENT AND BRICK COATING.
American Cement Paint Co.
Dixon Crucible Co., Jos.
Du Pont de Nemours & Co., E. I.
Hockaday Co.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

CENTRAL STATION (ELECTRIC).
Alabama Power Co.
Georgia Railway & Power Co.

CENTRIFUGALS.
Cresson-Morris Co.
Fletcher Works.
Goulds Mfg. Co.
Schaum & Uhlinger.
Tolhurst Mch. Wks.

CHAIN DRIVES.
(See Belting—Chain Link.)

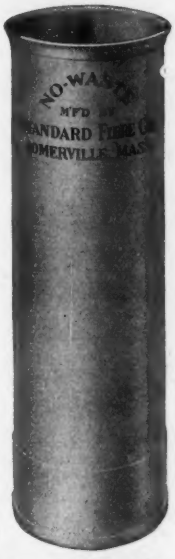
WRITE US
for catalog on
other
Mill Receptacles.

No-Waste
SEAMLESS ROVING CANS

Waste Baskets
Taper Baskets
Oval Cans
Elliptical Cans

Sizes
9"-10"-11"-12"-14"-18"
diameters
and
up to 45" high

NO
seams, joints,
or
Rivets.



Styles

Polished
Steel
or
Rolled Fibre
Top Rims
Rings
BEADED
securely
to
Hard Fibre
Shells.

Hard Fibre
MILL BARRELS
Plain Fibre
and
NEW PATTERN
Steel Clad
Trucks and Boxes
Combination
Doffing Cars

STANDARD FIBRE CO.
Somerville, Massachusetts

Shafts, Pulleys,
Hangers, Belting
Packing, Lacing

BOILERS

For Mills and
Public Works.
Low Prices

Tanks, Stacks, Smoke Flues, Boiler Tubes, Pipe, Valves, Fittings, Kerosene and Gasoline Engines, Wood Saws, Pumps, Heaters, Injectors, Engine Supplies and Repairs for Mills, Hotels, Public Works.

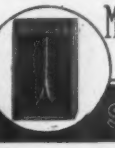
Iron and Brass Castings Cast Every Day.

LOMBARD Foundry, Machine, Boiler Works, and Supply Store
AUGUSTA, GEORGIA

CORTRIGHT
METAL SHINGLES

You lay them right over the old roof. There is no exposure. Then again, they are fire and lightning proof. And as to durability—some laid thirty-three years ago are still tight.

CORTRIGHT METAL ROOFING CO.
Philadelphia Chicago



STANDARD SINCE 1887

SOFT WATER - CLEAR WATER
FOR EVERY PURPOSE

DECALSO ZERO WATER SOFTENERS
LIME AND SODA WATER SOFTENERS
PRESSURE AND GRAVITY FILTERS

SOFTENER

FOR PARTICULARS ADDRESS
AMERICAN WATER SOFTENER CO.
LEHIGH AVE. AT 4TH ST.
PHILADELPHIA, PA.

FILTER

BYC
TRADE MARK

BARBER-COLMAN COMPANY
Main Office and Factory
Rockford, Ill.
Boston, Mass. Greenville, S. C.
WARP TYING MACHINES
WARP DRAWING MACHINES
HAND KNOTTERS FOR SPOOLING AND WINDING

BUYERS' INDEX—Continued.

CHAIN—BLOCK, BICYCLE, AUTO, ENGINE, AGRICULTURAL, ETC.)
Morse Chain Co.
Renold, Inc., Hans.

CHAIRS AND STOOLS.
(See Furniture—Mill.)

CHECK STRAPS.
Bond Co., Chas .
Hayes Loom Reed & Harness Co.
Jacobs Mfg. Co., E. H.

CHEMICALS.
(See Dyestuffs and Chemicals.)

CHLORINE GAS.
Electro Bleaching Gas Co
Mathieson Alkali Works, Inc.

CLEANING MACHINE—BLOWER.
Clements Mfg. Co.

CLEANING AND AERATING MACHINE FOR COTTON.
Murray Company, The.

CLEARER CLOTH.
Philadelphia Felt Co.

CLOCKS—HANK, ETC.
(See Counters.)

CLOCKS (TIME).
Silberberg, Mortimer J.

CLOCKS—WATCHMAN.
Foxboro Co,. Inc.

CLOSETS—WATER.
(See Toilets.)

CLOTH—ROLLER, CLEARER, SLASHER.
Philadelphia Felt Co.

CLOTH CUTTERS.
Firsching, J. A.
Wildman Mfg. Co.

CLOTH GUIDER (ELECTRIC).
Blake Electric Mfg. Co.

CLOTH REELS.
Gallaudet Aircraft Corp.

CLOTH ROOM MACHINERY.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Butterworth, H. W., & Sons Co
Firsching, J. A.
Grinnell Co.
Lord Bros.
Saco-Lowell Shops.
Textile Finishing Mchry. Co
Williams Co., J. H.
Wildman Mfg. Co.

CLOTH SHRINKING MACHINERY.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Tolhurst Mch. Wks.

CLOTH TESTERS.
Scott Co., Henry L.

CLOTH WINDERS.
(See Winders.)

CLOTHING—CARD & NAPPER.
Davis & Furber Mch. Co.

CLUTCHES—FRICTION.
Allis-Chalmers Mfg. Co.
Brown Co., A. & F.
Carlyle-Johnson Machine Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Mason, Volney W.
Wood's Sons Co., T. B.

CLUTCH LININGS.
Brown Co., A. & F.

COAL AND ASH HANDLING MACHINERY.
Link-Belt Company.

COAL TAR DISINFECTANTS
(See Disinfectants.)

COCKS.
(See Valves.)

COLOR PAILS.
(See Buckets—Mill.)

COMB APRONS.
(See Aprons.)

COMBERS AND COMBER SUPPLIES.
Belger Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Wks.

COMMISSION MERCHANTS & DEALERS.
(See Cotton Cloth Commission Merchants.)

COMPRESSORS—AIR, GAS, ETC.
Allis-Chalmers Mfg. Co.
General Electric Co.
Goulds Mfg. Co.

COMMUTATOR BRUSHES.
(See Brushes—Motor and Generator.)

CONCRETE REINFORCEMENT.
Birmingham Slag Co.

CONDENSERS.
Allis-Chalmers Mfg. Co.

CONDUITS.
(See Elec. Machinery & Supplies.)

CONNECTORS—FRANKEL SOLDERLESS.
Westinghouse Elec. & Mfg. Co.

CONSULTING ENGINEERS
(See Architects and Engineers.)

CONTRACTORS AND ENGINEERS—BUILDING.
Foundation Co.
Sirrine & Co., J. E.
Stuhrman, Edw. A.
Thompson & Binger, Inc.
Truscon Steel Co.

CONTRACTORS——ELECTRICAL.
(See Electrical Engineers.)

CONTRACTORS (HEATING & PLUMBING).
Walker Electric & Plb. Co.

CONTROLLING INSTRUMENTS—TEMPERATURE.
Foxboro Co., Inc.
General Electric Co.
Mates-Brown Co., B. P.
Taylor Instrument Co.

CONVEYORS—BELT.
(See Belt Conveyors.)

CONVEYING MACHINERY.
American Supply Co.
Chisholm-Moore Mfg. Co.
Collins, J. D.
Cresson-Morris Co.
Curtis Pneumatic Mchry. Co.
Link-Belt Co.
Mason, Volney W.
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Schofield, Wm. Co.

CONVEYORS—PORTABLE.
Link-Belt Co.

COOLERS.
(See Humidifying Apparatus.)

COOLERS—WATER.
(See Water Coolers.)

COOLING AND CONDITIONING MACHINES.
Grinnell Co.

COOLING TOWERS.
(See Tanks and Towers.)

COPPER STAMPS AND STENCILS.
(See Stamps, Stencils, etc.)

CORDAGE MACHINERY.
Davis & Furber Mch. Co.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

COST SYSTEMS.
Ernst & Ernst.

COTTON CLEANING AND AERATING MACHINE.
Murray Company, The.

COTTON YARN AND CLOTH COMMISSION MERCHANTS AND DEALERS.
Aberfoyle Mfg. Co.
Boger & Crawford.
Callaway Mills.
Carver-Beaver Yarn Co., Inc.
Fawcett, Hughes.
Florsheim, H. A.
Southern Yarn Co.
Weimar Bros.
Woodward, Baldwin & Co.

COTTON MERCHANTS AND BROKERS.
Beer & Co., H. & B.

COTTON MILL MACHINERY AND SUPPLIES.
Allen Co.
Atlanta Harness & Reed Mfg. Co.
Auto Creel Corp.
Barber-Colman Co.
Belger Co.
Blake Electric Mfg. Co.
Brooks & Doxey, Ltd.
Butterworth & Sons, H. W.
Crompton & Knowles Loom Works.
Davis & Furber Mch. Co.
Draper Corporation.
Durant Mfg. Co.
Eclipse Textile Devices, Inc.
Firsching Co., J. A.
Fletcher Works.
Foxboro Co., Inc.
Gallaudet Aircraft Corp.
Greist Mfg. Co.
Grinnell Co.
Hayes Loom Reed & Harness Co.
Howard & Bullough.
Hunt Machine Co., Rodney.
Jacobs Mfg. Co., E. H.
Keystone Fibre Co.
Lestershire Spool & Mfg. Co.
Leyland & Co., Thos.
Lord Bros.
Mates-Brown Co., Inc., B. P.
Mossberg Pressed Steel Corp.
Parker Co, Walter S.
Phila. Drying Mchry. Co.
Philadelphia Felt Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Shambow Shuttle Co.
Southern Bending Co.
Stafford Co.
Steel Heddle Mfg. Co.
Suter, Alfred.
Terrell Machine Co.
Textile Finishing Machinery Co.
Textile Specialty Co.
Tolhurst Mch. Wks.
Universal Winding Co.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.
Washburn & Sons, L. R.
Williams Co., J. H.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

COTTON TAPE LOOM.
Davis & Furber Mch. Co.
Fletcher Works.
Schaum & Uhlinger.

COTTON YARN MILLS.
(See Yarn Manufacturers.)

COUNTERS—REVOLUTION, HANK, PICK, ETC.
Durant Mfg. Co.
Foxboro Co.

COUNTERS—RESTAURANT.
(See Restaurant Equipment.)

COUPLING—SHAFT.
Cresson-Morris Co.
Wood's Sons Co., T. B.

COVERING—ROLLER.
Bond Co., Chas.
Davis & Furber Mch. Co.
Philadelphia Felt Co.

CRANES.
(See Hoists.)

CREELS (AUTOMATIC).
Auto Creel Corp.
Suter, Alfred.

CREOSOTED FLOORING, BLOCKS, POSTS, SHINGLES, ETC.
Southern Wood Preserving Co.

CULVERTS.
Dixie Culvert & Metal Co.

CUTS FOR PRINTING.
Jacobs & Co.

CUTTERS—CLOTH.
(See Cloth Cutters.)

CUTTERS—THREAD.
(See Thread Cutters.)

DELIVERY CASES.
(See Boxes—Packing.)

DESKS—FACTORY.
Lupton's Sons Co., David.

DIAL SCALES.
(See Scales.)

DIES—STEEL.
(See Stamps, Stencils, Etc.)

DIE STOCKS.
(See Pipe Threaders.)

DIRECTORY—TEXTILE.
Davison Pub. Co.

DISINFECTANTS.
Barrett Co., The.

DOBBY CHAINS.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

DOBBY CARDS.
Jacobs Mfg. Co., E. H.

DOFFING BOXES—MILL.
(See Boxes—Mill.)

DOFFING CARS.
(See Cars.)

DOORS—STEEL.
Lupton's Sons Co., David.

DOUBLING MACHINERY.
Davis & Furber Mch. Co.
Brooks & Doxey, Ltd.
Lord Bros.

DRAWINGS AND ARTWORK.
Jacobs & Co,

DRAINAGE ENGINEERS.
Dixie Culvert & Metal Co.

DRAWING FRAMES.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

DRILLS—ELECTRIC.
(See Electric Machinery.)

DRINKING FOUNTAINS.
(See Fountains—Drinking.)

DROP WIRES.
Draper Corp.
Greist Mfg. Co.
Mossberg Pressed Steel Corp.
Steel Heddle Mfg. Co.
Williams Co., J. H.

DRYING APPARATUS.
Bayley Mfg. Co.
Buckeye Blower Co.
Grinnell Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz ,Inc.

DRYING FORMS—HOSIERY.
Pearson, Jos. T.

DRYING MACHINERY.
American Laundry Mchry. Co.
Butterworth, H. W., & Sons Co.
Grinnell Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

DUST COLLECTORS.
(See Blowers and Blowing Systems.)

DUSTING MACHINERY.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

DYERS, BLEACHERS AND FINISHERS.
American Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.
Franklin Process Co.

DYEING, BLEACHING, FINISHING AND PRINTING MACHINERY AND EQUIPMENT.
American Laundry Mchry. Co.
Brandwood, John.
Butterworth & Sons Co., H. W.
Cole Mfg. Co., R. D.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Franklin Process Co.
Grinnell Co.
Hauser-Stander Tank Co.
Hunt Machine Co., Rodney.
Klauder-Weldon Dyeing Mch. Co.
Macomb Machine Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.
Woolford Wood Tank Co., G.

DYEING MACHINES (PACKAGE AND SPOOL.
Brandwood, John.
Franklin Process Co.

DYE STICKS.
Phila. Drying Machinery Co.

DYE VATS AND TUBS.
(See Tanks or Bleaching Kiers.)

DYESTUFFS AND CHEMICALS.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Central Dyestuff & Chemical Co.
Ciba Co., Inc.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Ford Co., J. B.
Grasselli Chemical Co.
India Alkali Works.
Kali Mfg. Co.
Lennig & Co., Chas.
Leyland Co., Thos.
Mathieson Alkali Works, Inc
Mates-Brown Co., Inc., B. P.
Metz & Co., H. A.
National Aniline & Chemical Co.
Newport Chemical Works, Inc.
Roessler & Hasslacher Chemical Co.
Rohm & Haas Co.
Sandoz Chemical Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques.

ELECTRIC CONDUIT AND FITTINGS.
(See Electrical Machinery and Supplies.)

ELECTRIC DYNAMOS AND MOTORS.
(See Motors and Generators.)

ELECTRIC FANS.
(See Fans—Electric.)

ELECTRIC LAMPS.
(See Lamps.)

ELECTRIC LAMP GUARDS.
Flexible Steel Lacing Co.
Ivanhoe Regent Works.

ELECTRICAL ENGINEERS AND CONTRACTORS.
Curtis, Paul W.
Huntington & Guerry, Inc.
Ivanhoe Regent Works.
Walker Electric & Plbg. Co.

ELECTRIC LIGHTING ENGINEERS.
(See Illuminating Engineers.)

ELECTRICAL MACHINERY AND SUPPLIES.
Allis-Chalmers Mfg. Co.
Bayley Mfg. Co.
Blake Electric Mfg. Co.
Carter Electric Co.
Cooper Hewitt Electric Co.
Curtis, Paul W.
Cutter Works, George.
Federal Electric Co.
General Electric Co.
Ivanhoe-Regent Works.
Mason, Volney W.
Walker Electric & Plbg. Co.
Walsh & Weidner Boiler Co.
Westinghouse Elec. & Mfg. Co.

ELECTRIC PRESSES (HIGH PRESSURE).
Rex Eng'g Corp.

ELECTRIC TRACTORS AND TRUCKS.
(See Tractors and Trucks—Electric.)

ELECTROTYPES.
Jacobs & Co.

ELEVATORS—PORTABLE.
Collins, J. D.

ELEVATIORS.
Link-Belt Company.

ENAMELED IRON AND GLASS FOR TEXTILE MACHRY.
Mitchell-Bissell Co.

ENAMEL—MILL WHITE.
(See Paint.)

ENGINEERS—MILL.
(See Architects.)

ENGINES—OIL, GAS AND GASOLINE.
Allis-Chalmers Mfg. Co.

ENGINES—STEAM.
Allis-Chalmers Mfg. Co.
Cole Mfg. Co., R. D.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Toomey, Frank.

ENGINE ROOM APPLIANCES AND SUPPLIES.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.
Oster Mfg. Co.
Westinghouse Elec. & Mfg. Co.

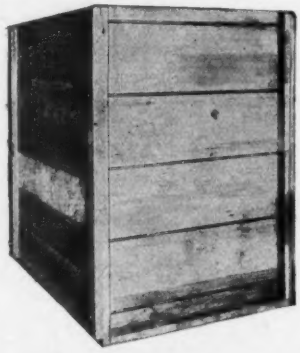
ETCHING —PRINTING).
Jacobs & Co.

ENGRAVING AND CUTS.
Jacobs & Co.

EXPORTERS—COTTON.
(See Brokers.)

EXTRACTORS—HYDRO.
American Laundry Mchry. Co
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

FACTORY DESKS.
Lupton's Sons Co., David.
Manufacturing Equip. & Eng'g Co.



Cypress Tanks
Wooden Packing Cases
ALL STYLES

Manufactured from

GEORGIA PINE POPLAR CYPRESS

WHITE PINE and GUM

Your Inquiry Solicited

Hightower Box & Tank Co.

ATLANTA, GA. BIRMINGHAM, ALA.

TUPELO
"THE HARD-WEAR" LUMBER

has about every advantage for

TEXTILE MILL FLOORING

Because of its "involved" grain it resists severe friction for lots of profitable years, without slivering or splintering. Get all the facts. Write

SOUTHERN CYPRESS MFRS. ASSOCIATION
805 Poydras Building, New Orleans, La., or
805 Graham Building, Jacksonville, Fla.

UCPC

Direct Sulphur Chrome } **Dyes** { Basic Vat Acid

Special Shades Matched

VELVETEEN

The Best Boil-off and Finish

Softeners *Oils* *Finishes*

UNITED CHEMICAL PRODUCTS CORPORATION

Importers, Exporters and Manufacturers

York & Colgate Sts. Jersey City, N. J.

Southern Office, 307 Commercial National Bank Building Charlotte N. C.

REPRESENTATIVES:

R. T. GRANT, Charlotte, N. C.

GEO. W. WATSON, Hazlehurst, Miss. LINDSAY PADGETT, Shelby, N. C.

Morehead
~~Back to Boiler~~
SYSTEM

Answer 23 Questions

If you will answer just twenty-three questions for us we will estimate the fuel saving, decreased labor costs and increased production that you may expect from the Morehead Back-to-Boiler System. Write for the questions today.

Morehead Manufacturing Company

Dept. C, Detroit, Michigan.

(36)

ALL STEEL ECONOMY FIRE PROOF **BALING PRESSES**

ALL SIZES FOR ALL PURPOSES

LARGEST LINE BUILT IN U.S.A.

ECONOMY BALER CO., DEPT C ANN ARBOR, MICH., U.S.A.

WATER

WE-FU-GO AND SCAIFE

PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES

WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.

BUYERS' INDEX—Continued.

FACTORY & INDUSTRIAL SITES.
Alabama Power Co.
Georgia Ry. & Power Co.
Texas & Pacific Ry.
Nashville Industrial Corp.

FACTORY MANAGEMENT SYSTEMS.
Ernst & Ernst.

FANS—ELECTRIC.
Bayley Mfg. Co.
Buckeye Blower Co.
Carter Electric Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

FANS—CONVEYING, POWER AND EXHAUST.
(See Blowers and Blowing.)
Systems.)

FASTENERS—BELT.
(See Belt Fasterers.)

FEED WATER PURIFIERS.
(See Boiler Feed Water Purification.)

FEEDERS.
(See Automatic Feeders.)

FELT CLOTH FOR ROLLS.
Philadelphia Felt Co.

FELTING MACHINERY.
Smith & Furbush Mch. Co.

FENCE—STEEL AND IRON.
Anchor Post Iron Works.

FENCE POSTS—CREOSOTED PINE.
Southern Wood Preserving Co.

FIBRE PRODUCTS.
Keystone Fibre Co.
Standard Fibre Co.

FILLING—CAP AND WARP.
U. S. Bobbin & Shuttle Co.

FILLING STATION PUMPS.
Bowser & Co., S. F.

FILTERS—WATER.
American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons Co., Wm. B.

FILTERS—OIL REMOVAL.
Norwood Engineering Co.

FILTERS (OIL).
Burt Mfg. Co.

FILTERS (ALUM).
Lennig & Co., Chas.

FINISHING.
(See Dyers, Bleachers and Finishers.)

FINISHING, BLEACHING AND SIZING MATERIALS.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Central Dyestuff & Chemical Co.
Ciba Co., Inc.
Corn Products Refining Co.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Electric Smelting & Aluminum Co.
Ford Co., J. B.
India Alkali Works.
Kali Mfg. Co.
Keever Starch Co.
Lennig & Co., Chas.
Leyland & Co., Thos.
Mates-Brown Co., Inc., B. P.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Newport Chemical Works.
Roessler & Hasslacher Co.
Rohm & Haas Co.
Sandos Chemical Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

FIRE DOORS AND HARDWARE.
Lupton Sons Co., David.
Sanymetal Products Co.
Truscon Steel Co.

FIRE EXTINGUISHERS.
Grinnell Co.

FIRE HOSE.
(See Hose—Fire.)

FIRE PROTECTING PAINT.
(See Paint.)

FLAX SPINNING.
U. S. Bobbin & Shuttle Co.

FLEXIBLE COUPLINGS.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.

FLOOD LIGHTS—ELECTRIC.
Cooper Hewitt Electric Co.
General Electric Co.

FLOORING LUMBER.
Hightower Box & Tank Co.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co

FLOORING (TILE & BRICK).
National Paving Brick Co.

FLOORING—WOOD BLOCKS.
Southern Wood Preserving Co

FLOOR SCRUBBING MACHINE.
American Scrubbing Equipment Co.

FLOOR SCRUBBING POWDERS.
(See Scrubbing Powders.)

FLOOR SWEEPS.
(See Brushes.)

FLUTED ROLLS.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Schofield & Sons, J. S.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co
Whitin Machine Works.

FLYERS.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co
Whitin Machine Works.

FOUNDERS.
Briggs-Shaffner Co.
Brown Co., A. & F.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdy. & Mch. Works

FOUNTAINS—DRINKING.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Miles Refrigerating Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

FRICTION CLUTCHES.
(See Clutches—Friction.)

FURNITURE—MILL.
Allen Co.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Mfg. Co.

FUSES—ELECTRIC.
Carter Electric Co.
Federal Electric Co.

GARNETT MACHINES.
Roy & Son Co., B. S.
Smith & Furbush Mch. Co

GAS ENGINES.
(See Engines—Gas.)

GAS HOLDERS.
Chicago Bridge & Iron Wks.

GASOLINE PUMPS AND STORAGE TANKS.
Bowser & Co., S. F.

GAUGE (YARN CLEANER).
Mates-Brown Co., Inc., B. P.

GAUGES—STEAM PRESSURE, ETC.
Foxboro Co., Inc.
Taylor Instrument Co.

GAUGE—OIL.
Brown Co., A. & F.
Lunkenheimer Co.

GAUGES—WATER.
Lunkenheimer Co.

GEARS—SILENT.
Brown Co., A. & F.
General Electric Co.
Link-Belt Company.
Morse Chain Co.
Renold, Hans.

GEAR CUTTING AND CUTTERS.
Brown Co., A. & F.
Cresson-Morris Co.

GEAR PULLERS.
General Electric Co.

GENERATORS—ELECTRIC.
(See Motors and Generators.)

GLASSWARE AND DISHES.
(See Dishes.)

GLASS SKYLIGHTS.
Drouve Co., G.

GOVERNORS—PUMP.
General Electric Co.

GRAPHIC CHARTS.
Ernst & Ernst.

GRAPHITE.
Dixon Crucible Co., Jos.

GRATES—BOILER.
Cole Mfg. Co., R. D.
International Eng. Works.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

GRATES—MECHANICAL.
(See Stokers.)

GREASE.
(See Lubricants.)

GREASE CUPS.
(See Lubricators.)

GRINDER—CARD, CYLINDER, ROLL, NAPPER AND GARNET.
(See Card Grinding Machinery)

GUARDS—ELECTRIC LAMP.
(See Electric Lamp Guards.)

GUARDS—MACHINE, SKYLIGHT, WINDOW, ETC.
Anchor Post Iron Works.

GUIDES—THREAD.
Mitchell-Bissell Co.
Palmer Co., I. E.

GUIDER—CLOTH-ELECTRIC.
Blake Electric Mfg. Co.

GUMS.
(See Finishing and Sizing Materials.)

HALFTONES—PRINTNG.
Jacobs & Co.

HANGERS.
(See Shafting and Hangers.)

HANKS CLOCKS.
(See Counters.)

HARDWARE—BUILDING.
Sanymetal Products Co.

HARNESS—LOOM.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Crompton & Knowles Loom Works.
Emmons Loom Harness Co.
Greist Mfg. Co.
Garland Mfg. Co.
Hayes Loom Reed & Harness Co.

HEADS—BOBBIN AND SPOOL.
Allen Co.
Lestershire Spool & Bobbin Co.
Parker Co., Walter S.
U. S. Bobbin & Shuttle Co.

HEATERS.
Bayley Mfg. Co.

HEATING AND VENTILATING APPARATUS.
(See Ventilating Apparatus.)

HEATING & PLUMBING CONTRACTORS.
Walker Electric & Plbg. Co.

HEDDLES.
Crompton & Knowles Loom Works.
Draper Corporation.
Steel Heddle Mfg. Co.
Williams Co., J. H.

HEDDLE FRAMES.
Crompton & Knowles Loom Works.
Steel Heddle Mfg. Co.
Williams Co., J. H.

HOISTS.
Chisholm Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.
Link-Belt Company.
Mason, Volney W.
Morse Chain Co.

HOPPER FEEDERS.
(See Automatic Feeders.)

HOSE—FIRE.
Collins, J. D.

HOSIERY DYEING MACHINERY.
Cole Mfg. Co., R. D.
Franklin Process Co.
Philadelphia Drying Mchry. Co.

HOSIERY FORMS.
(See Drying Forms.)

HOSIERY YARNS.
(See Yarn Manufacturers.)

HOTELS.
Hotel Cecil.
Hotel Martinique.
Hotel Sinton.
Hotel Tuller.

HUMIDIFYING APPARATUS.
American Moistening Co.
Bayley Mfg. Co.
Carrier Eng. Corp.
Grinnell Co.
Mates-Brown Co., B. P.
Parks-Cramer Co.

HUMIDITY INDICATING INSTRUMENTS.
Mates-Brown Co., B. P.
Taylor Inst. Co.

HYDROMETERS.
Taylor Instrument Co.

HYDGRODEIKS.
Taylor Instrument Co.

HYGROMETERS.
Foxboro Co.
Mates-Brown Co., B. P.
Taylor Inst. Co.

HYDRAULIC TURBINES.
(See Turbines—Hydraulic.)

HYDRO EXTRACTORS.
(See Extractors.)

ICE MACHINES.
Miles Refrigerating Co.

ILLUMINATING ENGINEERS.
Curtis, Paul W.
Huntington & Guerry.
Ivanhoe-Regent Works.

INDICATING AND RECORDING INSTRUMENTS AND THERMOMETERS.
Durant Mfg. Co.
Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

INDIGO.
(See Dyestuffs and Chemicals.)

INDUSTRIAL SITES.
Alabama Power Co.
Georgia Ry. & Power Co.
Nashville Industrial Corp.
Texas & Pacific Ry.

INJECTORS.
Lunkenheimer Co.

INK—STENCIL AND MARKING.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

IRON WORK—ORNAMENTAL.
Anchor Post Iron Works.
Chicago Bridge & Iron Wks.
Dufur & Co.
Lombard Iron Works & Supply Co.
Royal Metal Mfg. Co.

JACK SPOOLS.
(See Spools.)

JACQUARDS.
Crompton & Knowles Loom Works.

JOINT COMPOUND.
Dixon Crucible Co., Jos.

JUTE BAGGING MACHINE.
Davis & Furber Mch. Co.
Smith & Furbush Machine Co.

KETTLES—SIZE.
(See Size Kettles.)

KETTLES—SODA.
Chicago Bridge & Iron Wks.
Lombard Iron Works & Supply Co.

KIERS.
(See Bleaching Kiers.)

KNIT GOODS.
(See Cotton Cloth Commission Merchants and Dealers.)

KNIT GOODS WASHERS.
(See Washers—Cloth.)

KNITTING MACHINERY AND SUPPLIES.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Scott & Williams.
Torrington Co.
Trump Bros. Machine Co.
Wildman Mfg. Co.

KNITTING NEEEDLES.
Torrington Co.

LABORATORY INSTRUMENTS
Scott & Co., Henry L.
Foxboro Co.
Taylor Instrument Co.

LACING—BELT.
(See Belt Lacing.)

LAMPS—INCANDESCENT AND ARC.
Carter Electric Co.
Cooper Hewitt Electric Co.
Curtis, Paul W.
Cutter Works, George.
General Electric Co.
Ivanhoe-Regent Works of G. E. Co.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

LAMP GUARDS—KEY LOCKING.
(See Electric Lamp Guards.)

LAMP REFLECTORS.
Carter Electric Co.
Cooper Hewitt Electric Co.
Curtis, Paul W.
Cutter Works, George.
Ivanhoe-Regent Works of G. E. Co.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

LANDSCAPE ARCHITECTS.
(See Village Architects.)

LAPPERS.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Lord Bros.
Saco-Lowell Shops.
Smith & Furbush Mch. Co.
Whitin Machine Works.

LAUNDRY MACHINERY.
American Laundry Mchry. Co
Fletcher Works.
Hunt Machine Co., Rodney.
Schaum & Uhlinger.
Tolhurst Machine Works.

LAVATORIES.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Vogel Co., Jos. A.

LEATHER BELTING.
(See Belting.)

LEATHER SPECIALTIES.
American Supply Co.
Bond Co., Chas.
Jacobs Mfg. Co., E. H.
Williams & Sons, I. B.

LIGHTS—FLOOD.
Cutter Works, George.
Cooper Hewitt Electric Co.
General Electric Co.
Ivanhoe-Regent Works.
Westinghouse Elec. & Mfg. Co.

LIGHTING ENGINEERS AND CONTRACTORS.
(See Illuminating Engineers.)

LINEN YARNS.
(See Yarns—Linen.)

LINK BELTING.
(See Belting—Link.)

LINTERS.
(See Waste Dealers.)

LIQUID CHLORINE.
(See Chlorine.)

LOADERS—WAGON AND TRUCK.
Ling-Belt Company.

LOCKERS—METAL.
Collins, J. D.
Lupton Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturers Equip. & Eng. Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

LOGWOOD EXTRACT.
(See Dyestuffs and Chemicals.)

LOOMS.
Crompton & Knowles Loom Works.
Davis & Furber Mch. Co.
Draper Corporation.
Fletcher Works.
Saco-Lowell Shops.
Schaum & Uhlinger.
Stafford Co.

LOOM ATTACHMENTS—AUTOMATIC.
Draper Corporation.

LOOM HARNESS.
(See Harness.)

LOOP PICKERS.
Jacobs Mfg. Co., E. H.

LUBRICANTS.
D-A Lubricant Co.
Dixon Crucible Co., Jos.
Lamson Oil Co., Inc.
Masury-Young Co.
N. Y. & N. J. Lubricant Co.
Texas Co.

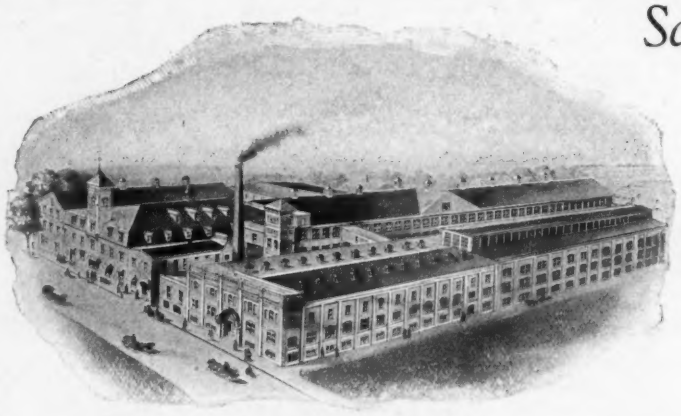
LUBRICATORS.
Bowser & Co., S. F.
Lidseen.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.

LUG STRAPS.
(See Straps—Lug.)

LUMBER.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co

LUNCH ROOM EQUIPMENT.
(See Restaurant.)

MACHINE TOOLS.
(See Tools.)



Satisfaction Guaranteed

on all COTTON HARNESS, MAIL HARNESS, SELVEDGE HARNESS, REEDS, SLASHER AND STRIKING COMBS, WARPER AND LIECE REEDS, BEAMER AND DRESSER HECKS, MENDING EYES, JACQUARD HEDDLES, ETC.

The quality of our products and the service we render is alone responsible for our growth. Emmons Quality Loom Harness and Reeds have retained every old customer and gained new customers year after year.

Let us add your name to our list of satisfied customers.

Submit your requirements to use for estimates.

EMMONS LOOM HARNESS CO., LAWRENCE, MASS.

SOLE AGENTS FOR WARDWELL PICKERS

The Largest Manufacturers of Loom Harness and Reeds in America.

Southern Representative: Geo. F. Bahan.

EMMONS LOOM HARNESS AND REEDS

NO MORE SECONDS

From Oil Stains

"REMOVOIL"

Looks After That!

A few drops of "REMOVOIL" on an oil stain—a little rubbing—GONE!

Goods going direct to the bleach—a few drops of "REMOVOIL"—NO rubbing necessary—oil stain is removed in the bleach.

Will not injure the finest and most delicate fabrics.

White goods mills all over the country are deriving the excellent results to be obtained from "REMOVOIL" and are eliminating seconds due to oil stains.

Why not use "REMOVOIL in your mill? We are sure you will be pleased with it.

Write us today for full particulars and prices.

"Our Success Represents Confidence Won by Integrity."

MASURY-YOUNG CO.

Established 1857. **Boston, Mass.**

BUYERS' INDEX—Continued.

MACHINISTS.
Briggs-Shaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Works.

MARKING POTS, STENCILS, INKS, ETC.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

MERCERIZED YARNS.
(See Yarn Manufacturers).

MERCERIZERS.
Aberfoyle Mfg. Co.
Amer. Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.

MERCERIZED YARN.
Aberfoyle Mfg. Co.
American Yarn & Pro. Co.
Boger & Crawford Co.
Dixie Mercerizing Co.

MERCERIZING MACHINERY.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

METAL CEILINGS, ETC.
Lupton's Sons Co., David.
Truscon Steel Co.

METALS—PERFORATED.
(See Screens and Sieves.)

METERS—FLOW, AIR, GAS, ELECTRIC, STEAM, ETC.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Foxboro Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

METERS—COUNTING.
(See Counters.)

MILL BASKETS AND BOXES.
(See Boxes—Mill.)

MILL ENGINEER.
(See Architects and Engineers.)

MILL VILLAGES.
(See Villages.)

MILL SUPPLIES—MISCELLANEOUS.
(See Supplies—Mill.)

MILL WHITE PAINT.
(See Paint.)

MOPS.
Atlanta Brush Co.
Southwestern Broom Mfg. Co.

MOTION PICTURES.
(See Films.)

MOTORS AND GENERATORS—ELECTRIC.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Curtis, Paul W.
General Electric Co.
Nashville Industrial Corp.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

MOVING PICTURE MCH. AND SUPPLIES.
(See Theatre Equipment.)

MULES.
Davis & Furber Mch. Co.

NAPPERS.
Davis & Furber Mch. Co.
Roy & Son Co., B. S.

NAPPER CLOTHING.
Davis & Furber Mch. Co.

NEEDLES—KNITTING.
Torrington Co.

OFFICE EQUIPMENT & SUPPLIES.
Carter Electric Co.
Jacobs & Co.
Lupton's Sons Co., David.
Monroe Calculating Mch. Co.
Royal Metal Mfg. Co.
Smith & Bros. Typewriter Co.
Sanymetal Products Co.

OFFICE PARTITIONS.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

OIL—LUBRICATING.
D-A Lubricant Co.
Johnson & Co., Inc., Oliver.
Lamson Oil Co., Inc.
Masury-Young Co.
Texas Co.
Wadsworth, Howland & Co., Inc.

OIL ENGINES.
(See Engine Oil.)

OIL FILTERS.
Burt Mfg. Co.

OILS—FINISHING.
(See Finishing and Sizing Materials.)

OIL CANS.
Lidseen.

OIL CUPS.
(See Lubricators.)

OIL PAPER.
Bradley Mfg. Co., A. J.

OIL SEPARATORS.
(See Separators.)

OIL STORAGE TANKS AND PUMPS.
Bowser & Co., S. F.

OILING DEVICES.
(See Lubricators.)

OPENING MACHINERY—COTTON, WOOL, WASTE, ETC.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Lord Bros.
Murray Company, The.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

OVERHEAD CARRIERS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.

OXIDIZING MACHINERY.
Phila. Drying Machinery Co.

OXYGEN.
Bird-Potts Co., Inc.
Commercial Acetylene Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

PACKING BOXES AND CASES—WOODEN.
Hauser-Stander Tank Co.
Hightower Box & Tank Co.
Lewis Co., G. B.
Walke Box Co., Inc.

PACKINGS.
Jenkins Bros.

PAINT.
American Cement Paint Co.
Barrett Co., The.
Dixon Crucible Co., Jos.
Du Pont de Nemours & Co., E. I.
Hockaday Co.
Johnson & Co., Oliver.
Wadsworth, Howland & Co. Inc.
Ware Paint Co.

PAINTING CONTRACTORS.
(See Contractors.)

PANEL BOARDS.
(See Switchboards.)

PAPER.
Bradley Mfg. Co., A. J.

PARTITIONS—STEEL AND WIRE.
Anchor Post Iron Works.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

PERBORATE OF SODA.
Roessler & Hasslacher Chemical Co.

PERFORATED METAL.
(See Screens and Sieves.)

PEROXIDES.
Roessler & Hasslacher Chemical Co.

PICK COUNTERS.
(See Counters.)

PICKERS—CURLED HAIR.
Davis & Furber Mch. Co.
Schofield Co., Wm.
Smith & Furbush Machine Co.

PICKERS—LEATHER.
Bond Co., Chas.
Garland Mfg. Co.
Jacobs Mfg. Co., E. H.

PICKER LOOPS.
Jacobs Mfg. Co., E. H.

PICKER STICKS.
Davis & Furber Mch. Co.
Garland Mfg. Co.

PICKING MACHINERY.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Howard & Bullough Am. Machine Co.
Lord Bros.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

PINIONS.
General Electric Co.

PIPE—STEEL RIVETED.
Chicago Bridge & Iron Wks.
Youngstown Sheet & Tube Co.

PIPE AND PIPE FITTINGS.
Chicago Bridge & Iron Wks.
Crane Co.
Grinnell Co.
Lunkenheimer Co.
Parks-Cramer Co.
Scaife & Sons Co., Wm. B.
Walker Electric & Plbg. Co.

PIPE DRAINAGE.
Dixie Culvert & Metal Co.
Youngstown Sheet & Tube Co.

PIPE JOINT COMPOUND.
Dixon Crucible Co., Jos.

PIPE THREADING AND CUTTING MACHINES.
Oster Mfg. Co.

PIPING—COTTON.
Youngstown Sheet & Tube Co.

PIPING ENGINEERS.
Grinnell Co.
Walker Electric & Plbg. Co.

PIPE BENDING.
Grinnell Co.
Youngstown Sheet & Tube Co.

PIPING (POWER & PROCESS).
Grinnell Co.

PLAYGROUND APPARATUS & EQUIPMENT.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

PLUMBING & HEATING CONTRACTORS.
Walker Electric & Plbg. Co.

PNEUMATIC MACHINERY & TOOLS.
Curtis Pneumatic Mchry. Co.

PORCELAIN GUIDES.
Mitchell-Bissell Co.

PORTABLE CONVEYORS.
(See Conveyor.)

POSTS—FENCE (WOOD).
Southern Wood Preserving Co.

POWER—ELECTRIC.
Alabama Power Co.
Georgia Ry. & Power Co.

POWER TRANSMISSION.
Aldrich Machine Works.
Allis-Chalmers Mfg. Co.
Bond Co., Chas.
Brown Co., A. & F.
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
Dixon Crucible Co., Jos.
Fafnir Bearing Co.
Flexible Steel Lacing Co.
General Electric Co.
Grinnell Co.
Hyatt Roller Bearing Co.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.
Wood's Sons Co., T. B.

PRESERVATIVE PAINT FOR METAL WORK.
(See Paints.)

PRESSED STEEL.
Lupton's Sons Co., David.

PRESSES.
American Laundry. Mchry. Co.
Butterworth & Sons Co., H. W.
Economy Baler Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Rex Eng'g Corp.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

PRESSURE REGULATORS.
(See Regulators—Pressure.)

PRINTING.
Jacobs & Co.
Showalter Printing Co., A. J.

PULLEYS.
Brown Co., A. & F.
Cole Mfg. Co., R. D.
Dodge Sales & Eng. Co.
Cresson-Morris Co.
Link-Belt Company.
Mason, Volney W.
Renold, Inc., Hans.
Wood's Sons Co., T. B.

PULLEY COVERING.
Williams & Sons, I. B.

PUMPS.
Allis-Chalmers Mfg. Co.
Bowser & Co., S. F.
Goulds Mfg. Co.
Sydnor Pump & Well Co., Inc.
Toomey, Frank.
Walsh & Weidner Boiler Co., The.
Westinghouse Elec. & Mfg. Co.

PUMPS—OIL.
Bowser & Co., S. F.
Lunkenheimer Co.

PUMP VALVES.
(See Valve Discs.)

PYROMETERS.
Foxboro Co.
Taylor Instrument Co.

QUILLS.
Jordan Mfg. Co.
U. S. Bobbin & Shuttle Co.

QUILL CLEANING MACHINES.
Terrell Machine Co.

RAILWAYS.
A. & W. P. Ry.
Georgia Railroad.
Southern Railway System.
Texas & Pacific Ry.

RAW STOCK DRYING SYSTEMS.
Brandwood, John.

RECEPTACLES—FIBRE.
(See Fibre Products.)

RECORDING INSTRUMENTS.
Durant Mfg. Co.
Foxboro Co., Inc.
General Electric Co.
Mates-Brown Co., B. P.
Service Recorder Co.
Taylor Instrument Co.

REEDS.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Emmons Loom Harness Co.
Hayes Loom Reed & Harness Co.

REELS.
Crompton & Knowes Loom Works.
Davis & Furber Mch. Co.
Draper Corporation.
Gallaudet Aircraft Corporation.
Hunt Machine Co., Rodney.
Mossberg Pressed Steel Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

REFLECTORS—LAMP.
(See Lamp Reflectors.)

REGULATORS—LIQUID LEVEL.
Foxboro Co., Inc.
General Electric Co.

REGULATORS—PRESSURE.
Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

REGULATORS—TEMPERATURE.
(See Temperature Controllers.)

REINFORCING SLAG.
Birmingham Slag Co.

REPAIRING—ELECTRICAL.
Briggs-Shaffner Co.
Curtis, Paul W.
Westinghouse Elec. & Mfg. Co.

REPAIRING—TEXTILE MACHINERY, ETC.
Bird-Potts Co., Inc.
Briggs-Shaffner Co.
General Machine Works.
Southern Spindle & Flyer Co.
Standard Gas Products Co.

RESTAURANT EQUIPMENT.
Sanymetal Products Co.

RIBBERS.
(See Knitting Machinery.)

RIB TOP CUTTERS.
General Machine Works.
Wildman Mfg. Co.

RING TRAVELERS—STEEL AND BRONZE.
Whitinsville Spinning Ring Co.
Whitin Machine Works.

RINGS—SPINNING.
(See Spinning Rings.)

ROCKER SHAFT BEARINGS.
(See Bearings.)

ROLLS—CALENDER.
Brooks & Doxey, Ltd.
Butterworth & Sons Co., H. W.
Davis & Furber Mch. Co.
Lord Bros.
Roy & Son Co., B. S.
Textile Finishing Mchry. Co.
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

ROLLS—RUBBER COVERED.
Butterworth & Sons Co., H. W.
Textile Finishing Mchry. Co.
Washburn & Sons, L. R.

ROLLS—STEEL.
Allen Co.
Brooks & Doxey, Ltd.
Butterworth & Sons Co., H. W.
Davis & Furber Mch. Co.
Lord Bros.
Southern Spindle & Flyer Co.
Textile Finishing Mchry. Co.
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

ROLLS (WOODEN).
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

ROLLER CLOTH.
Philadelphia Felt Co.

ROLLER LEATHER.
Bond & Co., Chas.

ROLL WASTE PACKERS.
Belger Co.

ROOFING.
Barrett Co., The.
Cortright Metal Roofing Co.
Southern Wood Preserving Co.
Wadsworth, Howland & Co.

ROOF AND CEMENT COATING.
American Cement Paint Co.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Hockaday Co.
Johnson & Co., Inc., Oliver.
Wadsworth, Howland & Co
Ware Paint Co.

ROPE—TRANSMISSION.
Allis-Chalmers Mfg. Co.
Brown Co., A. & F.
Cresson-Morris Co
Link-Belt Company.

ROPE SHEAVES.
Brown Co., A. & F.

ROVING CANS.
(See Cans—Roving.)

ROVING MACHINERY.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

RUBBER STAMPS.
(See Stamps, Stencils, Etc.)

SALAMANDERS.
Drouve Co., G.

SALTS.
(See Finishing & Sizing Materials.)

SANITARY PRODUCTS.
Crane Co.
Dixie Culvert & Metal Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Sanymetal Products Co.
Taylor, Halsey W.
Vogel Co., Jos. A.
Walker Electric & Plbg. Co.

SASH-WINDOW—STEEL.
Drouve Co., G.
Lupton's Sons Co., David.
Sanymetal Products Co.
Truscon Steel Co.

SASH OPERATOR.
Drouve Co., G.

SCALE PREVENTER—BOILER.
(See Boiler Feed Water Purification.)

SCREENS—MOVING PICTURE.
Southern Theatre Equip. Co.

SCREENS AND SIEVES—PERFORATED.
Allis-Chalmers Mfg. Co.
Erdle Perforating Co.
Link-Belt Company.

SCOURING MACHINERY.
(See Washers—Cloth.)

SCRUBBING MACHINE—FLOOR.
American Scrubbing Mach. Co.

SCRUBBING AND WASHING POWDERS.
Mathieson Alkali Works.
India Alkali Works.
Warren Soap Mfg. Co.

SCUTCHERS.
Brooks & Doxey, Ltd.
Lord Bros.
Whitin Machine Works.

SECOND HAND MACHINERY AND SUPPLIES
Nashville Industrial Corp.
Toomey, Frank, Inc.

SELVAGE HARNESS.
(See Harness.)

SEWING MACHINES.
Merrow Machine Co., The.
Textile Finishing Mchry. Co.

SHADES—ELECTRIC LAMP.
(See Reflectors.)

SHADES (WINDOW).
Hough Shade Corp.

SPUR-CAP SHELLS

Made to Stand the Hard Knocks

MANUFACTURED BY

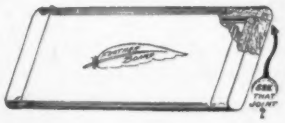
GALLAUDET AIRCRAFT CORP'N.,

EAST GREENWICH, R. I.

Pat. Applied for

FEATHERBOARD

The Master Cloth Reel



LIGHT AND STRONG. IMPROVES YOUR PUT UP.

HORTON TANKS

SERVE COTTON MILLS AND MILL COMMUNITIES WELL

We furnish full information, or plans, specifications and estimates without obligating you.

CHICAGO BRIDGE & IRON WORKS

NEW YORK — 3130 Hudson Terminal

ATLANTA — 1042 Forsyth Bldg.

ALLIGATOR

STEEL BELT LACING

Strength Comes First

Try Alligator, the Strongest Belt Lacing on Earth. "Every Tooth a Vise." Mechanically perfect. Quick, easy and economical. A size for every belt thickness. Write for samples and interesting text book. Sold through Jobber-Dealer trade channels the world over.

Flexible Steel Lacing Company

4619 Lexington Street, Chicago, Ill., U. S. A.

In England at 135 Finsbury Pavement, London, E.C., 2

PUMPS

INDUSTRIAL — AGRICULTURAL — MUNICIPAL — RESIDENTIAL

A type for every service.
Bulletins on request.

The Goulds Manufacturing Company
SENECA FALLS, N. Y.

GOULDS

Schofield Patent Automatic Opener and Duster

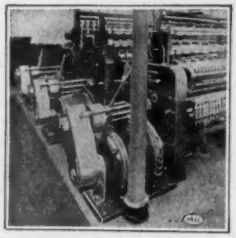
For opening and dusting Wool, Cotton, Linters, Hair and kindred fibrous substances.

"Schofield" intermediate feeds for Cards, Wool, Rag, Waste, Hair and Lumper Pickers, Automatic, Cone and Oldham Willows, Rag and Extract Dusters, Waste Pullers, Blamaine Lap Feeds, Curled Hair Pickers, Needle Looms, etc.

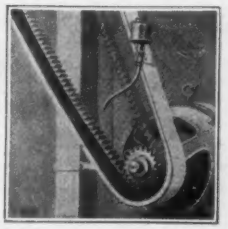
WILLIAM SCHOFIELD COMPANY

Iron Founders, Textile Machinery Builders.

Krams Ave., Manayunk, Philadelphia, Pa.



RENOLD CHAINS



WRITE FOR BULLETIN #0004/7 "TEXTILE APPLICATIONS"

Montreal — HANS RENOLD INC., — *Toronto*

365 Broadway, N. Y.

KEEP WATER OUT OF WOOD TO PREVENT ROTTING

Properly used, **Ware Weather Wood Preservative Paint** is guaranteed to make wood, waterproof and weather proof. It greatly prolongs the life of timbers to which it is applied.
Used and recommended by Industrial Plants and Cotton Mills for shingle roofs or wood surfaces and by Counties for Bridge Timbers, etc., where the surface is exposed to weather and wear. Write for further detailed information concerning Stains, Composition Paints, Bridge Paints, Roofing, Roofing Material and other Ware Weather Products.

REPRESENTATIVES:
Georgia and Tennessee, A. W. Beddingfield and C. L. McKissick—Alabama, E. F. Ogburn.

WARE PAINT COMPANY,
ATLANTA, GA.

REPRESENTATIVES:
North Carolina, R. P. Ellis—South Carolina, H. N. Hunt; Florida and Cuba, B. P. Becht.

Ware Weather Wood Preservative Paint
For All Wooden Structures

Ware Weather Metallic Elastic Paint
For All Metal Surfaces

BUYERS' INDEX—Continued.

SHAFTING AND HANGERS.
Allis-Chalmers Mfg. Co.
Brown Co., A. & F.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Fafnir Bearing Co.
Grinnell Co.
Link-Belt Co.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
Wood's Sons Co., T. B.

SHEARS.
Roy & Sons Co., B. S.

SHELVING—SECTIONAL STEEL.
Collins, J. D.
Hyatt Roller Bearing Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

SHINGLES—ASPHALT.
Barrett Co.

SHINGLES—METAL.
Cortright Metal Roofing Co.

SHINGLES—WOOD.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

SHIPPING ROOM MACHINERY AND SUPPLIES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Collins, J. D.
Hauser-Stander Tank Co.
Hightower Box & Tank Co.
Royal Metal Mfg. Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Standard Fibre Co.
Walke Box Co., Inc.

SHOWER BATHS AND CABINETS.
Crane Co.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

SHUTTLES.
Crompton & Knowles Loom Works.
Draper Corporation.
Jordan Mfg. Co.
Shambow Shuttle Co.
U. S. Bobbin & Shuttle Co.
Williams Co., J. H.

SIGNS—ELECTRIC.
Federal Electric Co.

SINGEING MACHINERY.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

SIREN.
Brown Co., A. & F.
Federal Electric Co.

SITES FOR FACTORIES.
(See Industrial Sites.)

SIZE BOX TEMPERATURE CONTROLLER.
Foxboro Co.

SIZE KETTLES AND TANKS.
Butterworth & Sons Co., H. W.
Hauser-Stander Tank Co.
Howard & Bullough American Machine Co.
Lombard Iron Wks. & Sup. Co.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.
Woolford Wood Tank Co., G.

SIZING AND FINISHING COMPOUNDS.
(See Finishing and Sizing Materials.)

SKEWERS.
Jordan Mfg. Co.

SKYLIGHTS.
Drouve Co., G.
Lupton's Sons Co., David.

SLAG FOR CONCRETE.
Birmingham Slag Co.

SLASHERS AND SLASHER ROOM SUPPLIES.
Allen Co.
Butterworth & Sons Co., H. W.
Cole Mfg. Co., R. D.
Davis & Furber Mch. Co.
Howard & Bullough.
Mossberg Pressed Steel Corp.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

SLASHER CLOTH.
Philadelphia Felt Co.

SLASHER HOODS.
Cole Mfg Co., R. D.

SLASHER TAPE.
(See Tape—Slasher.)

SLATE ASPHALT ROOFING.
Barrett Co.

SLIDING PARTITION HARDWARE.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Sanymetal Products Co.

SLUBBERS.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Whitin Machine Works.

SMOKE STACKS.
Chicago Bridge & Iron Wks.

SOAP—TEXTILE.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Ciba Co., Inc.
Du Pont de Nemours & Co., E. I.
Electric Smelting & Aluminum Co.
India Alkali Wks.
Kali Mfg. Co.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Mates-Brown Co., Inc., B. P.
Newport Chemical Works.
Rohm & Hass Co.
Sonneborn Sons, Inc., L.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

SODA—TEXTILE, SODA ASH AND BOILING.
Lennig & Co., Chas.
Leyland & Co., Thos.
Mathieson Alkali Works, Inc.
Sonneborn Sons, Inc., L.

SOFTENERS—COTTON.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Bosson & Lane.
Central Dyestuff & Chem. Co.
Ciba Co., Inc.
Du Pont de Nemours & Co., E. I.
Ford Co., J. B.
Grasselli Chemical Co.
Kali Mfg. Co.
Lennig & Co., Chas.
Mates-Brown Co., Inc., B. P.
Newport Chemical Works.
Roessler & Hasslacher Chemical Co.
Rohm & Haas Co.
Sonneborn Sons, Inc., L.
United Chemical Prod. Corp
Wolf & Co., Jacques.

SOFTENERS—WATER.
(See Water Softeners.)

SOLDERLESS CONNECTORS—FRANKEL.
Westinghouse Elec. & Mfg. Co

SOLOZONE.
Roessler & Hasslacher Chem. Co.

SOLVENTS.
(See Finishing.)

SPEEDERS.
Jordan Mfg. Co.
Parker & Co., Walter S.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

SPEEDOMETERS.
(See Counters.)

SPINDLES.
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co
Vermont Spool & Bobbin Co.
Whitin Machine Works.

SPINNERS.
Aberfoyle Mfg. Co.
Amer. Yarn & Processing Co
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Boger & Crawford.
Calloway Mills, Inc.
Flint Mfg. Co.
Fletcher Works.
Florsheim, H. A.
Gray Mfg. Co.
Myrtle Mills, Inc.
Philadelphia Felt Co.
Parkdale Mills, Inc.
Southern Yarn Co.

SPINNING FRAMES.
American Machine Co., H. & B.
Crompton & Knowles Loom Works.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Howard & Bullough.
Lord Bros.
Schaum & Uhlinger.
Saco-Lowell Shops.
Whitin Machine Works.

SPINNING GRADES.
Valley Waste Mills.

SPINNING RINGS.
Brooks & Doxey, Ltd.
Draper Corporation.
Howard & Bullough.
Greist Mfg. Co.
Lord Bros.
Whitin Machine Works.
Whitinsville Spinning Ring Co

SPINNING TAPE SPECIALISTS.
American Textile Banding Co Inc.
Barber Mfg. Co.

SPOOLING MACHINERY AND SUPPLIES.
Davis & Furber Mch. Co.
Draper Corporation.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

SPOOLER TENSIONING DEVICE.
Textile Specialty Co.

SPOOLS AND SKEWERS.
Jordan Mfg. Co.
Leetershir eSpool & Mfg. Co.
Mossberg Pressed Steel Corp.
Parker Co., Walter S.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

SPRINKLER SYSTEMS.
Grinnell Co.

SPRINKLER TANKS.
(See Tanks, Towers, Etc.)

SPROCKETS.
Link-Belt Company
Morse Chain Co.
Renold, Inc., Hans.

SPUR CAP SHELLS.
Gallaudet Aircraft Corporation

STAMPS, STENCILS AND STENCIL MACHINES.
Atlanta Stamp & Stencil Wks
Bradley Mfg. Co., A. J.

STAND PIPES.
(See Tanks.)

STARCH AND GUMS.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co.
Corn Products Refining Co.
Kali Mfg. Co.
Keever Starch Co.
Mathieson Alkali Works, Inc.
Metz Co., H. A.
Staley Co., A. E.
Warren Soap Co.

STEAM ENGINES.
(See Engines—Steam.)

STEAM HOSE.
(See Hose—Fire.)

STEAM PUMPS.
(See Pumps—Steam.)

STEAM SEPARATORS.
(See Separators.)

STEAM TRAPS.
(See Traps—Steam.)

STEEL PLATE CONSTRUCTION.
Chicago Bridge & Iron Wks.

STEEL RIVETED PIPE.
Chicago Bridge & Iron Wks.

STEEL SHELVING, DOORS, WINDOW PARTITIONS, ETC.
Collins, J. D.
Lupton & Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.
Truscon Steel Co.

STENCILS AND STENCIL PAPERS.
(See Stamps and Stencils.)

STENCIL BRUSHES.
(See Marking Pots and Brushes.)

STENCIL CUTTING MACHINES
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

STICKS—PICKER.
(See Picker Sticks..)

STOOLS.
(See Furniture—Mill.)

STOP WATCHES.
Service Recorder Co.
Silberberg, Mortimer J.

STOP MOTION.
Crompton & Knowles Loom Works.
Draper Corporation.
Eclipse Textile Devices, Inc.
Textile Specialty Co.
Whitin Machine Works.
Wildman Mfg. Co.

STOKERS.
Westinghouse Elec. & Mfg. Co.

STORAGE RACKS.
(See Shelving.)

STRAPS (LUG, CHECK, HEEL, TUGGER, PICKER HARNESS, ETC.)
Atlanta Harness & Reed Co.
Bond & Co., Chas.
Hayes Loom Harness & Reed Co.
Jacobs Mfg. Co., E. H.
Garland Mfg. Co.

STRAPPING.
(See Leather Specialties or Check Straps.)

STREET LIGHTING FIXTURES.
Cutter Works, George.

SULPHIDES.
(See Finishing & Sizing Materials.)

SULPHUROUS ACID GENERATOR.
Macomb Machine Co.

SUPPLIES—GENERAL MILL.
Brown, A. & F.
Dodge Sales & Eng. Co.
Jenkins Bros.
Lunkenheimer Co.
Nashville Industrial Corp.

SWITCHES—KNIFE-ELEC.
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

SWITCHBOARDS—PANEL.
Cutter Co., George
General Electric Co.
Westinghouse Elec. & Mfg. Co.

SYSTEMS (BUSINESS).
Ernst & Ernst.

TABLES—MILL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.

TALLOW.
(See Finishing Machinery.)

TANKS—OIL, GASOLINE, PAINT, ETC.
Bowser & Co., S. F.

TANKS (ELEVATED).
Chicago Bridge & Iron Wks.
Cole Mfg. Co., R. D.
Lombard Iron Works.
Walsh & Weidner Boiler Co.
Woolford Wood Tank Co., G.

TANKS (SPRINKLER).
Chicago Bridge & Iron Wks.
Cole Mfg. Co., R. D.
Grinnell Co.
Lombard Iron Works.
Woolford Wood Tank Co., G.

TANKS (STEEL STORAGE).
Chicago Bridge & Iron Wks.
Cole Mfg. Co., R. D.
Grinnell Co.
Lombard Iron Works.
Walsh & Weidner Boiler Co.

TANKS (WOODEN).
Chicago Bridge & Iron Wks.
Grinnell Co.
Hauser-Stander Tank Co.
Hightower Box & Tank Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz.
Textile Finishing Mchry. Co.
Woolford Wood Tank Co., G.

TAPE CONDENSERS.
Davis & Furber Mch. Co.

TAPE LOOMS—COTTON.
Fletcher Works.
Schaum & Uhlinger.

TAPES AND BRAIDS.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Weimar Brothers.

TAPES—SPINNING AND TWISTING.
Barber Mfg. Co.

TAPE MAKING MACHINES.
(See Bandage and Tape Machinery.)

TAX SERVICE.
Ernst & Ernst.

TELEPHONE—CALLING SYSTEM.
Carter Electric Co.
General Electric Co.

TEMPERATURE REGULATORS
Carrier Eng. Corp.
Foxboro Co., Inc
General Electric Co.
Mates-Brown Co., B. P.
Parks-Cramer Co.
Taylor Instrument Co.

TEMPLES.
Draper Corporation.

TENTERS.
Butterworth & Sons Co., The.
Textile Finishing Mach. Co.

TENTER FRAME GUIDER—ELECTRIC.
Blake Electric Mfg. Co.

TENSION DEVICE FOR SPOOLERS.
Textile Specialty Co.

TENTER HOUSING & RECONSTRUCTING SYSTEM.
Proctor & Schwartz, Inc.

TESTERS FOR YARN, FABRIC CORD, ROPE, RUBBER, WIRE, ETC.
Scott & Co., Henry Co.

TEXTILE MACHINERY.
(See Cotton Mill Machinery.)

THEATRE EQUIPMENT.
Southern Theatre Equip. Co.

THERMOMETERS—ANGLE AND STRAIGHT STEM.
Foxboro Co.
Mates-Brown Co., B. P.
Taylor Instrument Co.

THERMOMETERS—RECORDING AND INDEX.
Foxboro Co.
Mates-Brown Co., B. P.
Taylor Instrument Co.

THERMOSTATS.
Foxboro Co.

THIN PLACE PREVENTERS.
Draper Corporation.

THREAD EXTRACTORS.
Brooks & Doxey, Ltd.
Lord Bros.

THREAD GUIDES.
Mitchell-Bissell Co.
Palmer Co., The I. E.
Textile Specialty Co.

TILE & BRICK.
National Paving Brick Co.
Piper Roofing Co., J. A.

TIMBER.
(See Lumber.)

TIME CLOCKS.
(See Clocks.)

TIERING MACHINES.
Collins, J. D.

TIES—BALING.
(See Bale Ties.)

TIRE FABRIC EQUIPMENT.
Fletcher Works.

TOILETS.
Crane Co.
Runville-Spence Mfg. Co.
Vogel Co., Jos. A.

THE TEXAS & PACIFIC RAILWAY

SERVES

Dallas — Fort Worth
El Paso — Abilene
Sweetwater — Cisco
Texarkana
IN TEXAS

New Orleans — Shreveport
Alexandria
IN LOUISIANA

Splendid opportunities for manufacture and distribution.

Address,

FRANK J. BURKE
Land and Industrial Commissioner
Dallas, Texas.

ALL ABOARD

Winter Excursion Fares And All Year Tourist Fares

—TO—

Alabama	Georgia	North Carolina
Arizona	Havana	Oregon
Arkansas	Kentucky	South Carolina
British Columbia	Louisiana	Tennessee
California	Mississippi	Texas
Florida	New Mexico	Virginia
Washington		West Virginia

—VIA—

Georgia Railroad
Atlanta & West Point R. R.
Western Railway of Alabama

Liberal time limit and stop-over privileges.
For further information apply to

J. P. BILLUPS, G. P. A.
714 HEALEY BUILDING, ATLANTA, GA.

Every Dye House
Should follow the plan of the Plant shown, where every Tank Installed is a

Woolford-Built Tank
We build for all Textile uses, in all shapes and sizes and of the wood best suited for the purpose.

It would be a pleasure to quote on your requirements.

G. WOOLFORD WOOD TANK MFG. CO.
Lincoln Bldg. Philadelphia, Pa.

"Cotton Mill Machinery Calculations"

EVERY Textile Man should have these reference books. They cover in a detailed and thorough manner all calculations necessary to be made on any cotton mill machinery manufactured in the United States and constitute one of the best references on the subject obtainable.

The two volumes are illustrated with 45 diagrams and contain 21 reference tables.

As the value of a book lies in its contents and not in a fancy cover, we have put these two volumes out in a strong, serviceable binding. You can secure them in conjunction with a subscription to COTTON.

Write for circulars and full information.

BUYERS' INDEX—Continued.

TOILET PARTITIONS.
Lupton's Sons Co., David.
Manufacturing Equip. & Eng'g Co.
Sanymetal Products Co.

TOOL CABINETS—STEEL.
Lupton's Sons Co., David.
Manufacturing Equip. & Eng'g Co.

TOOL STANDS—STEEL.
Lupton's Sons Co., David.
Royal Metal Mfg. Co.

TOWERS.
(See Tanks—Elevated.)

TRACTORS—ELECTRIC, INDUSTRIAL.
Collins, J. D.

TRANSMISSION—POWER.
(See Power Transmission Machinery.)

TRAPS—RETURN STEAM.
Morehead Mfg. Co.

TRIPTODS.
U. S. Bobbin & Shuttle Co.

TROLLEYS & HOISTS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry. Co.

TRUCKS—AUTO.
White Co.

TRUCKS, BASKETS, ETC.
Keystone Fibre Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co
Standard Fibre Co.

TRUCKS—ELECTRIC—INTER.
Collins, J. D.

TRUCKS—HAND AND ELEVATING.
Collins, J. D.

TRUCKS—INTER, ETC.
Keystone Fibre Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Standard Fibre Co.

TUBS.
(See Tanks—Woolen.)

TUBING—METAL.
Youngstown Sheet & Tube Co.

TURBINES—HYDRAULIC.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

TURBINE—STEAM.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

TWISTING MACHINERY AND SUPPLIES.
Barber Mfg. Co.
Davis & Furber Mch. Co.
Draper Corporation.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Works.

TYPEWRITERS
Smith & Bros. Typewriter Co.

URINALS.
Crane Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos A.

UNIONS—BRONZE.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

VACUUM PANS.
Cresson-Morris Co.

VALVES—ANGLE, GLOBE, CROSS, BLOW-OFF, CHECK, GATE, POP-SAFETY, ETC.
Crane Co.
Grinnell Co.
Jenkins Bros.
Lunkenheimer Co.

VALVES—FOOT.
Brown & Co., A. & F.

VALVES—NON-RETURN STOP.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

VARNISHES
Barrett Co.
Du Pont de Nemours & Co., E. I.
Hockaday Co.
Johnson & Co., Inc., Oliver.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

VATS.
(See Tanks—Wooden.)

VENTILATING APPARATUS.
Bayley Mfg. Co.
Buckeye Blower Co.
Carrier Eng. Corp.
Drouve Co., G.
General Electric Co.
Grinnell Co.
Hough Shade Corp.
Parks-Cramer Co.
Philadelphia Drying Mchry. Co.
Sargent's Sons Co., C. G.
Tolhurst Machine Co.
Walker Electric & Plbg. Co.

VENTILATING & HEATING CONTRACTORS.
Walker Electric & Plbg. Co.

VENTILATING WINDOW SHADES.
Hough Shade Corp.

VILLAGE ARCHITECTS AND DESIGNERS.
Robert & Co.
Sirrine, J. E.
Stuhrman, Edw. A.

VILLAGE HOUSES.
(See Houses—Ready-Built.)

WAGON AND CAR UNLOADERS.
Curtis Pneumatic Mchry. Co.

WAREHOUSE—PORTABLE.
(See Buildings.)

WAREHOUSE DOOR HARDWARE.
(See Doors and Hardware.)

WAREHOUSE TRUCKS.
(See Trucks.)

WARP DRAWING MACHINE.
Barber-Colman Co.
Crompton & Knowles Loom Works.

WARPERS AND WARPING MACHINERY AND SUPPLIES.
Auto Creel Corp.
Barber-Colman Co.
Brandwood, John.
Davis & Furber Mch. Co.
Brooks & Doxey, Ltd.
Draper Corporation.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Suter, Alfred.
U. S. Bobbin & Shuttle Co.

WASH BASINS.
(See Lavatories.)

WASHERS—CLOTH.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Hunt Machine Co. Rodney.
Klauder-Weldon Dyeing Mch. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Mchry. Co.
Tolhurst Mch. Wks.

WASHING POWDERS—FLOOR.
India Alkali Works.

WASTE BOUGHT AND SOLD.
Valley Waste Mills.

WASTE BINS—STEEL.
Lupton's Sons Co., David.

WASTE MACHINERY—COTTON.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Howard & Bullough.
Lord Bros.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Co.

WATCHES (TIME & STOP).
Service Recorder Co.
Silberberg Co., Mortimer J.

WATCHMAN CLOCKS.
(See Clocks—Watchman.)

WATER COOLERS—FOUNTAIN.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Miles Refrigerating Co.
Taylor, Halsey W.

WASTE SEPARATORS.
(See Separators.)

WATER SOFTENERS AND PURIFIERS.
American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons Co., Wm. B.

WATER SUPPLY SYSTEMS.
Hughes Specialty Well Drilling Co.
Sydnor Pump & Well Co., Inc.

WATER TOWERS.
(See Tanks—Elevated.)

WATERPROOFING MACHINERY.
Butterworth & Sons Co., H. W.
Textile Finishing Machinery Co., The.

WEAVING.
(See Yarn Manufacturers.

WELDING APPARATUS—ELECTRIC ARC.
Bird-Potts Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

WELDING APPARATUS AND SUPPLIES—OXY-ACETYLENE.
Bird-Potts Co., Inc.
Commercial Acetylene Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

WELDING—JOB.
Bird-Potts Co., Inc.
Briggs-Shaffner Co.
Grinnell Co.
Standard Gas Products Co.

WELFARE ARCHITECTS.
(See Village Architects.)

WELFARE EQUIPMENT.
American Laundry Mchry. Co.
Crane Co.
Cutter Works, George.
Dixie Culvert & Metal Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Rundle-Spence Mfg. Co.
Southern Theatre Equip. Co.
Taylor, Halsey W.
Westinghouse Elec. & Mfg. Co.

WELL DRILLING.
Hughes Specialty Well Drilling Co.
Sydnor Pump & Well Co., Inc.

WHEELS—FIBRE.
(See Fibre Products.)

WHEEL PULLER.
General Electric Co.

WHIP HOISTS.
Mason, Volney W.

WHISTLES—STEAM AND AIR.
Brown Co., A. & F.
Crane Co.
Jenkins Bros.
Lunkenheimer Co.

WHISTLES—ELECTRIC SIREN.
Federal Electric Co.

WHIZZERS.
Fletcher Works.
Tolhurst Mach. Wks.
Schaum & Uhlinger.

WINDERS.
Brooks & Doxey, Ltd.
Davis & Furber Mch. Co.
Firsching, J. A.
Howard & Bullough American Machine Co.
Lord Bros.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Universal Winding Co.

WINDOW FRAMES AND SASH—STEEL.
Drouve Co., G.
Lupton's Sons Co., David.
Truscon Steel Co.

WINDOW SASH—STEEL.
Drouve Co., G.
Lupton's Sons Co., David.

WINDOW SHADES.
Hough Shade Corp.

WIRES—DROP.
(See Drop Wires.)

WIRE HEDDLES.
(See Heddles.)

WIRING CONDUITS AND FITTINGS.
(See Electric Machinery and Supplies.)

WIRING—ELECTRICAL.
(See Electrical Contractors.)

WOOD.
(See Lumber.)

WOOD BLOCK FLOORING.
Southern Wood Preserving Co

WOOD BEAM HEADS.
Allen Co.

WOOD BOXES.
(See Packing Cases.

WOOD PRESERVER.
American Cement Paint Co.
Barrett Co.
Dixon Crucible Co., Jos.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Inc., Oliver.
Ware Paint Co.
Wadsworth, Howland & Co., Inc.

WOOD PULLEYS.
(See Pulleys.)

WOOD ROLLS.
Washburn & Sons, L. R.

WOOD TANKS.
(See Tanks.)

WOOLEN MACHINERY.
Butterworth & Sons Co., H. W.
Crompton & Knowles Loom Works.
Davis & Furber Mch. Co.
Schofield Co., Wm.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Smith & Furbush Mach. Co.
Textile Finishing Mchry. Co.
Whitin Machine Works.

YARN MANUFACTURERS.
Aberfoyle Mfg. Co
American Yarn & Processing Co.
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Boger & Crawford.
Callaway Mills, Inc.
Dixie Mercerizing Co.
Flint Mfg. Co.
Florsheim, H. A.
Gray Mfg. Co.
Myrtle Mills, Inc.
Parkdale Mills, Inc.
Philadelphia Felt Co.
Southern Yarn Co.
Weimar Bros.

YARN DEALERS AND COMMISSION MERCHANTS.
(See Cotton Yarn and Cloth Commission Merchants and Dealers.)

YARN DYERS.
(See Dyers.)

YARN DRYERS.
(See Dryers.)

YARN TESTERS.
Scott & Co., Henry L.

MASON'S
PATENT WHIP HOISTS

Used by Mills for
Hoisting Cotton, Wool, Hay, Etc.,
in and out.

Saves labor, time and money

Volney W. Mason & Co.
VOLNEY W. MASON, Owner
PROVIDENCE, R. I.

ELECTRIC WIRING CONTRACTOR

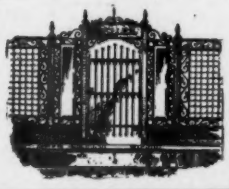
POWER

PAUL W. CURTIS
Chattanooga, Tenn.
TEXTILE WORK A SPECIALTY

SYDNOR'S SUPREME SERVICE

WELL DRILLING
and DEEP WELL PUMPS

We do the engineering and have been solving water problems satisfactorily for 25 years for textile mills.
SYDNOR PUMP & WELL CO., INC.,
Richmond, Va.

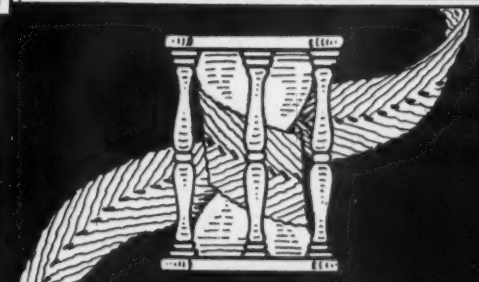


WIRE RAILINGS
WINDOW GUARDS
WIRE CLOTH
Established 1835.
DUFUR & CO.
309 N. Howard St. Baltimore, Md.

WELLS

HUGHES SPECIALTY
WELL DRILLING CO.
CHARLESTON ATLANTA
Established 1885

ADVERTISING is an economy and cuts the cost of selling, making lower prices or better goods possible without sacrifice of the sellers' profits.



The Test of Time

WHEN tape drive was first applied to cotton frames, Barber Tapes were the ones that were held up and selected by engineers as the best. The reason was that Barber Tapes were designed with the proper weight and construction to get maximum spindle speed and maximum service.

Since that time there have been many kinds of tape placed on the market, yet Barber still maintains that enviable reputation established years ago.

We carry extensive stocks and a wire to us at our expense brings service that is swift and sure. Write or wire for prices.

BARBER MFG. CO.,
Lowell, Mass.
Spinning Tape Specialists.

BARBER
Spinning & Twisting
TAPES

Advertisers' Index

Aberfoyle Mfg. Co. 86-R
Alabama Power Co. ...20 and 21
Aldrich Machine Works 272
Allen Co. 266
Allis-Chalmers Mfg. Co. 271
American Audit Co. 281
American Cement Paint Co.. 269
American Laundry Machinery Co. 77-R
American Machine Co., H. & B. 37-R
American Moistening Co. ...33-R
American Scrubbing Equipment Co. 263
American Supply Co. 264
American Textile Banding Co., Inc. 68-R
American Water Softener Co. 285
American Yarn & Processing Co. 281
Anchor Post Iron Works ...48-R
Arkray Mills, Inc. 278
Arlington Cotton Mills 278
Arnold, Hoffman & Co. 252
Arrow Mills, Inc. 278
Atlanta Brush Co. 263
Atlanta Harness & Reed Mfg. Co. 64-R
Atlanta Rubber Stamp & Stencil Works 278
Atlanta & West Point R. R... 293
Auto Creel Corp. 259

Barber-Colman Co. 285
Barber Mfg. Co. 295
Barrett Co. 35-R
Bayley Mfg. Co. 268
Beer Co., H. & B. 281
Belger Co. 257
Birmingham Slag Co. ..... *
Bird-Potts Co. 274
Blake Electric Mfg. Co..... *
Boger & Crawford 279
Bond & Co., Chas. 44-R
Borne, Scrymser Co. 253
Bossom & Lane 254
Bowser & Co., S. F., Inc. 27
Bradley Mfg. Co., A. J. 245
Brandwood, John 251
Briggs-Schaffner Co. 281
Brinton Co., H. 82-R
Brooks & Doxey (1920) Ltd. 12
Brown Co., A. & F. 31
Buckeye Blower Co. 60-R
Butterworth & Sons Co., H. W. 300

Callaway Mills, Inc. 279
Carlyle-Johnson Machine Co.. 275
Carrier Engineering Corp. .. 297
Carter Electric Co. 274
Carver-Beaver Yarn Co. 278
Central Dyestuff & Chemical Co. 68-R
Chicago Bridge & Iron Works 291
Chisholm-Moore Mfg. Co. ... 277
Ciba Co., Inc. 254
Citizens & Southern Bank... *
Classified Opportunities 282 & 283
Clements Mfg. Co. 297
Cole Mfg. Co., R. D. 297
Collins, J. D. 297
Commercial Acetylene Supply Co. 64-R
Cooper Hewitt Electric Co... *
Corn Products Refining Co... 249
Cortright Metal Roofing Co... 285
Crane Co. 35
Cresson-Morris Co. 274
Crompton & Knowles Loom Works 16
Curtis, Paul W. 295
Curtis Pneumatic Machinery Co. 277
Cutter Works, George 9

D-A Lubricant Co. 273
Davis, Roger W. 16
Davis & Furber Machine Co.. 17
Davison Publishing Co. 266
Dixie Culvert & Metal Co... *
Dixie Portland Cement Co... 272
Dixie Mercerizing Co. 86-R
Dixon Crucible Co., Jos. 64-R
Dodge Sales & Eng. Co. .... *
Draper Corporation 3
Drouve Co., G. 270
Dufur & Co. 295
Du Pont de Nemours Co., E. I. *
Durant Mfg. Co. 265

Eclipse Textile Devices 262
Economy Baler Co. 287
Electric Smelting & Aluminum Co. 253
Electro Bleaching Gas Co.... 297
Emmons Loom Harness Co... 289
Ernst & Ernst 44-R

Fafnir Bearing Co. 6
Fawcett, Hughes 279
Federal Electric Co. ..... *
Firsching Co., J. A. 64-R
Flexible Steel Lacing Co. ... 291
Fletcher Works 247
Flint Mfg. Co. 278
Florsheim, H. A. 278
Ford Co., J. B. 253
Foundation Co., The 36
Foxboro Co. 261
Franklin Process Co. 2

Gallaudet Aircraft Corp'n... 291
Garland Mfg. Co. 60-R
General Electric Co. ..... *
General Machine Works 84-R
Georgia Railroad 293
Georgia Railway & Power Co. *
Goulds Mfg. Co. 291
Grasselli Chemical Co. 250
Gray Mfg. Co. 278
Greist Mfg. Co. 256
Grinnell Co. ..... *

Hauser-Stander Tank Co. ... 297
Hayes Loom Reed & Harness Co. 264
Hemphill Co. 74-R
Hightower Box & Tank Co... 287
Hockaday Co. 269
Hotel Cecil 280
Hotel Martinique 280
Hotel Sinton 280
Hotel Tuller 280
Hough Shade Corp. 58-R
Howard & Bullough Amer. Mach. Co. 37-R
Hughes Specialty Well Drilling Co. 295
Hunt Machine Co., Rodney .. *
Huntington & Guerry, Inc. .. *
Hyatt Roller Bearing Co. ... 42

India Alkali Works 260
International Eng'g Works .. 34
Ivanhoe-Regent Works of G. E. Co. 39

Jacobs Mfg. Co., E. H. 297
Jacobs & Co. 26
Jenkins Bros. 275
Johnson & Co., Oliver 38
Jordan Mfg. Co. 64-R

Kali Mfg. Co. 247
Keever Starch Co. 250
Keystone Fibre Co. 267
Klauder-Weldon Dyeing Mach. Co. 248

Lamson Oil Co. 272
Lennig & Co., Chas. 252
Lestershire Spool & Mfg. Co.. 258
Lewis Co., G. B. 264
Lidseen 274
Link-Belt Co. 30
Lombard Fdry. & Mach. Wks. 285
Lord Bros. 22
Lunkenheimer Co. 13
Lupton's Sons Co., David ... 297
Lyon Metallic Mfg. Co. 265

Macomb Machine Co. 246
Manufacturing Equip. & Eng'g Co. 267
Mason, Volney W. 295
Masury-Young Co. 289
Mates-Brown Co., Inc., B. P. *
Mathieson Alkali Works, Inc. 299
Merrow Machine Co. 84-R
Metz Co., H. A. 52-R
Miles Refrigerating Co. ..... *
Mitchell-Bissell Co. 1
Monroe Calculating Machine Co. 46-R
Morehead Mfg. Co. 287
Morse Chain Co. 39
Mossberg Pressed Steel Corp 259
Murray Company, The 14
Myrtle Mills, Inc. 278

Nashville Industrial Corporation 283
National Aniline & Chemical Co. 40
National Paving Brick Co. .. *
National Shawmut Bank 23
Newport Chemical Works, Inc.56-R
New York & New Jersey Lubricant Co. 275
Norwood Engineering Co. .. 248

Oster Mfg. Co. 276
Oxweld Acetylene Co. 50-R

Palmer Co., I. E. 264
Parker Co., Walter S. 257
Parks-Cramer Co. 15
Parkdale Mills, Inc. 278
Pearson, Jos. T. 84-R
Phila. Drying Machinery Co. 248
Philadelphia Felt Co. 255
Proctor & Schwartz, Inc. ... 248

Re-Fil-It Broom Mfg. Co. .. 255
Reliance Machine Works ...84-R
Reno'd, Inc., Hans 291
Rex Engineering Corp. 19
Robert & Co. ..... *
Roessler & Hasslacher Chemical Co. 66-R
Rohm & Haas Co. 252
Ross-Gould Co. 268
Roy & Son Co., B. S. ..... *
Royal Metal Mfg. Co. 86-R
Rundle-Spence Mfg. Co. 267

Saco-Lowell Shops 16
Sandoz Chemical Co. 245
Sanymetal Products Co. 62-R
Sargent's Sons Corp., C. G... 246
Scaife & Sons, Wm. B. 287
Schaum & Uhlinger 247
Schofield's Sons Co., J. S. .. 276
Schofield Co., Wm. 291
Scott & Co., Henry L. 260
Scott & Williams, Inc. 71-R
Service Recorder Co. 260
Shambow Shuttle Co. 5
Showalter Printing Co., A. J. 270
Silberberg Co., Mortimer J... 265
Sirrine Co., J. E. 37
Skayef Ball Bearing Co. 4
Smith & Furbush Machine Co. 266
Smith & Bros. Typewriter Co., L. C. 268
Sonneborn Sons, Inc., L. ... *
Southern Cypress Mfg. Asso. 287
Southern Railway System ... *
Southern Spindle & Flyer Co. 260
Southern Theatre Equip. Co. 24
Southern Wood Preserving Co. 62-R
Southern Yarn Co. 279
Southwestern Broom Mfg. Co. 267
Stafford Co. 8
Staley Mfg. Co., A. E. 253
Standard Fibre Co. 285
Standard Gas Products Co... 276
Steel Heddle Mfg. Co. 56-R
Stuhrman, Edw. A. 54-R
Surpass Chemical Co. 245
Suter, Alfred 259
Sydnor Pump & Well Co. 295

Taylor Co., Halsey W. 267
Taylor Instrument Co. 68-R
Terrell Machine Co. 58-R
Texas Co. 29
Texas & Pacific Railway 293
Textile Finishing Machinery Co. 298
Textile Specialty Co. 262
Thompson & Binger, Inc..... *
Tolhurst Machine Works 41-R
Toomey, Frank, Inc. 282
Torrington Co., The 78-R
Transmission Ball Bearing Co. 273
Trump Bros. Machine Co....82-R
Truscon Steel Co. 7

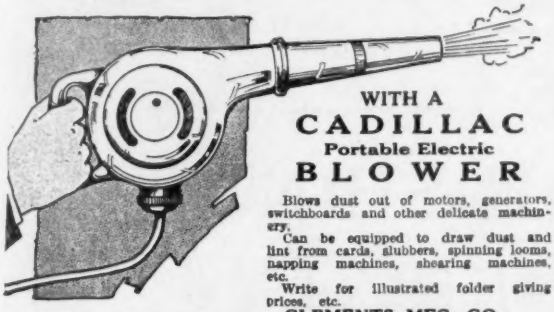
United Chemical Products Co. 287
Universal Winding Co. 72-R
U. S. Ball Bearing Co. 33
U. S. Bobbin & Shuttle Co... *

Valley Waste Mills ..... *
Vermont Spool & Bobbin Co. 258
Vogel Co., Jos. A. 268

Wadsworth, Howland & Co., Inc. 39-R
Walke Box Co. 245
Walker Electric & Plumbing Co. 271
Walsh & Weidner Boiler Co. 276
Want Ads 282
Ware Paint Co. 291
Warren Soap Mfg. Co. 60-R
Washburn & Son, L. R. 261
Weimar Bros. 278
Westinghouse Electric & Mfg. Co. .....9, 10 and 11
White Co. 25
Whitinsville Spinning Ring Co. 256
Whitin Machine Works 18
Wildman Mfg. Co. 80-R
Williams & Sons, I. B. ..... *
Williams Co., J. H. 18
Wolf & Co., Jacques 254
Wood's Sons Co., T. B. 28
Woodward, Baldwin & Co. .. 278
Woolford Wood Tank Mfg. Co., G. 293

Youngstown Sheet & Tube Co. 270

FIGHT "DUSTRUCTION"



WITH A
CADILLAC
Portable Electric
BLOWER

Blows dust out of motors, generators, switchboards and other delicate machinery.

Can be equipped to draw dust and lint from cards, slubbers, spinning looms, napping machines, shearing machines, etc.

Write for illustrated folder giving prices, etc.

Attach to any light socket. Weight 6 lb.

CLEMENTS MFG. CO.
612 Fulton St., Chicago

Elevated Tanks
Boilers, Engines
Castings
Hosiery Dye Machines

R. D. Cole Mfg. Co.
Newnan, Ga.

Liquid EBG Chlorine

Our container equipment includes 100 and 150 pound Cylinders, Ton Drums, and Tank Cars.

Electro Bleaching Gas Co.
PIONEER MANUFACTURERS of LIQUID CHLORINE
Plant: NIAGARA FALLS, N.Y.
Main office 18 East 41st Street New York. *Chicago office* 1 So. La Salle St.

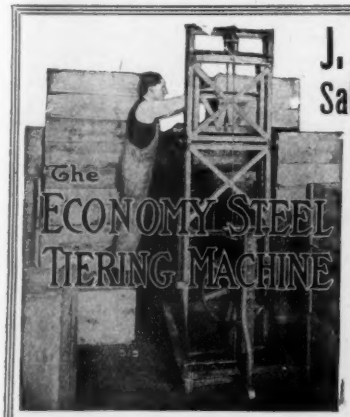
Carrier Engineering Corporation
750 FRELINGHUYSEN AVE., NEWARK, N. J.
Boston Buffalo Philadelphia Chicago New York

AIR CONDITIONING
(Manufactured Weather)

HUMIDIFICATION CLEANING
WINTER HEATING SUMMER COOLING

We will be glad to tell you why and how nearly two hundred of the finest mills in the U. S. are making "Every day a *good* day" with.

CARRIER EQUIPMENT



J. D. Collins Sales & Eng'g. Co.

STORAGE AND INDOOR TRANSPORTATION EQUIPMENT
55½ Luckie St.
Atlanta, Ga.

Equipment that will reduce your storage and handling expenses. Tiering Machines, Electric and Hand Trucks, Overhead Carriers, Gravity and Power Conveyors of all kinds.

Catalogs and full information furnished upon request

Lead Lined or Plain

HAUSER-STANDER WOODEN TANKS
OUTLAST STEEL

YESSIR! Although they're made of wood, they outlast steel—HAUSER-STANDER Wooden Tanks constructed of selected highest grade, Red Gulf Cypress, actually outlast steel many times over. This is not a false statement or theory—but a proven fact. Let us fill your requirements for wooden tanks—for any purpose—constructed in any size or shape—of Long Leaf Yellow Pine, Douglas Fir, as well as Genuine Red Gulf Cypress—just as you specify.

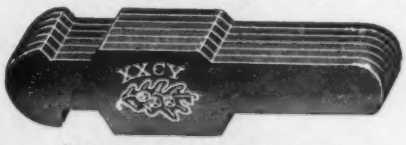
Write for our catalog, which explains in detail.

The Hauser-Stander Tank Co.
CINCINNATI, OHIO
Pittsburgh Office: 506 Bakewell Bldg.
"We Win With Quality"

Steel Shelving

Lupton
INVESTMENT VALUE
PHILADELPHIA

Factory Equipment
From Warehouse Stocks
David Lupton & Sons Co
Amber St. and Allegheny Ave.
Philadelphia



"JACOBS" XXCY DOLL PICKER
COTTON LOOM SIZE AND DUCK LOOM SIZE

Only pure oak bark tanned leather is used in this quality of picker, and it is treated by a secret process, giving a maximum of resiliency in the cushion or body where the shuttle strikes, which, it can be readily seen, represents the vital point of value in a loom picker.

The construction of this picker commends itself strongly. We should like to send all the samples you can use.

A Complete Line of "Jacobs" Loom Supplies Carried in Stock by all the Largest Supply Houses.

E. H. JACOBS MANUFACTURING COMPANY
DANIELSON, CONN.

MAIN OFFICE AND WORKS
PROVIDENCE, R. I.

NEW YORK OFFICE
HUDSON TERMINAL BLDG.

THE TEXTILE-FINISHING MACHINERY CO

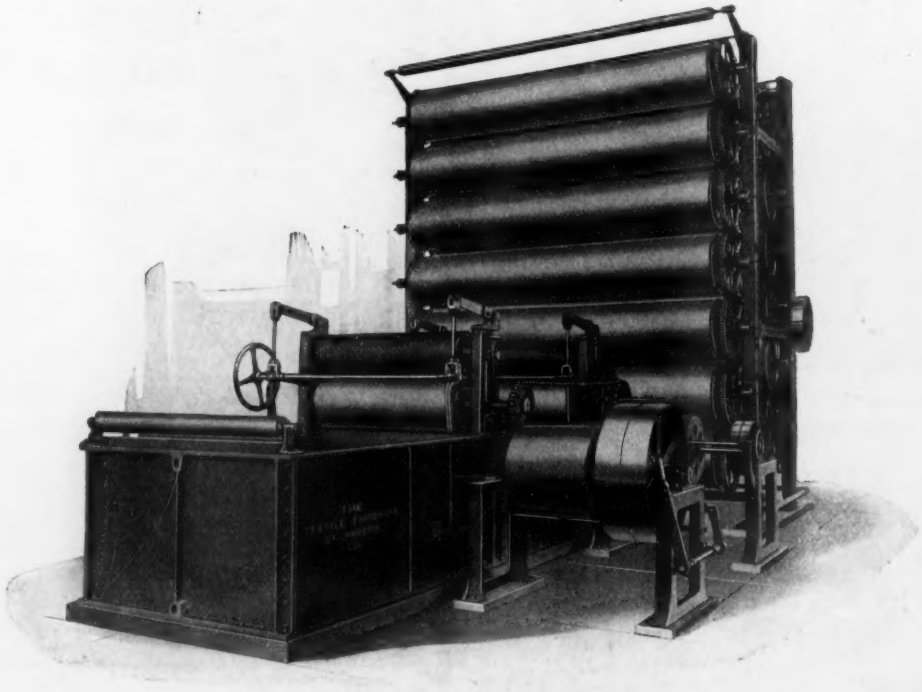
CANADIAN REPRESENTATIVES
WHITEHEAD, EMMANS, LTD.
MONTREAL

SOUTHERN REPRESENTATIVE
H. G. MAYER
CHARLOTTE, N. C.

YOUR INQUIRIES SOLICITED

FOR

Machinery for Singeing, Bleaching, Mercerizing, Dyeing, Drying, Printing and Finishing Textile Fabrics and Warps



414---Warp Washer and Dryer

Mathieson Alkali and Bleach

QUALITY: The care with which Mathieson Chemicals are made is responsible for their superior quality. Frequent tests are made throughout every step of manufacture, and purity and uniformity is maintained at the highest point. The name "Mathieson" on any chemical product is a guarantee that it is the highest quality that can be purchased anywhere. All our products are made in our own plants exclusively.

SERVICE: Our Technical Service Department is at your service without obligation on your part, to help you solve any problem in the bleaching or finishing of your product. They will be glad to advise you just what kind of product and what grade will best meet your needs economically. A demonstrator will be gladly sent to your mill **without obligation.**

QUICK SHIPMENT: Our Southern office is located in the heart of the Southern textile industry—Charlotte. We maintain distributing stocks at several centrally located points throughout the South to serve you in case of emergency. Shipments are made the same day order is received, shipment being made from the point located nearest you thereby reaching you more quickly and at less expense.

Here are a few of the Mathieson Chemicals:

LIQUID CHLORINE: A better, safer, 100% Pure Bleaching agent that gives the cloth a softer feel, a cleaner coloring and a greater tensile strength—no danger of goods yellowing or tendering, saves time and money. 100% Pure Anhydrous, shipped in 105, 150 and 2000 pound containers.

BLEACHING POWDER: The highest test and most stable bleach manufactured. Packed in steel drums, air tight, insuring full strength. Shipped in 225, 300, 450 and 750 pound drums.

SODA ASH: 58% Pure Alkali—both light and dense. Shipments in bulk, bags and barrels.

CAUSTIC SODA: Solid, ground or flaked. 60-70-74-76 and 78% grades. The electrolytic 78% grade, analyzing 99.70% Hydrate of Soda, is the purest caustic made. Shipments of Solid in steel drums; Ground and Flaked in barrels and drums.

BICARBONATE OF SODA: Purest grade, powdered and granular. Shipments in bags, barrels, kegs and cases.

VIRGINIA SODA (Sesquicarbonate of Soda): A beautiful white crystalline product, uniform in character and action. A superior neutral textile soda for washing and scouring. Shipments in barrels and bags.

Write, wire or phone our Southern office for your chemical supplies. Your satisfaction as to both quality and prompt service is assured.

THE MATHIESON ALKALI WORKS, Inc.

Executive Office: 25 West 43rd St., New York City

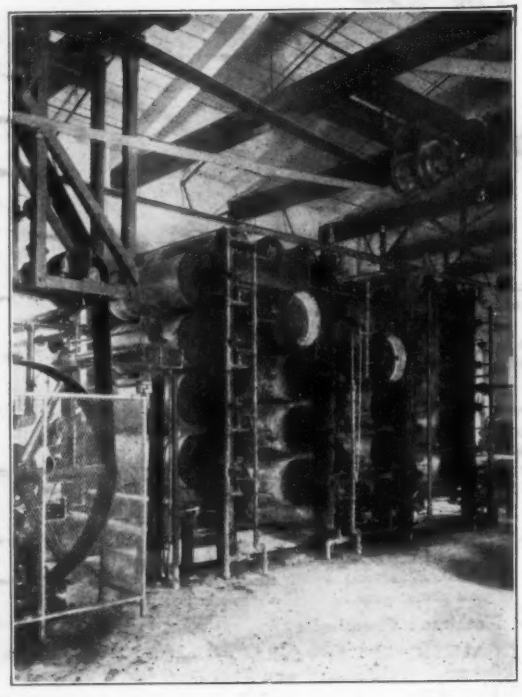
WORKS: Saltville, Va., and Niagara Falls, N. Y.

Southern Sales Office: Commercial National Bank Bldg., Charlotte, N. C.

BRANCH OFFICES

327 So. LaSalle St., Chicago, Ill. 911 Hospital Trust Bldg., Charlotte, N. C.
525 Widener Bldg., Philadelphia, Pa.

From the Standard Butterworth Line, a finishing machine of any kind can be built around YOUR product



Here's Another Installation.

The drying machine is arranged on four sets of vertical columns, having forty-one cylinders (five of copper and thirty-six of tinned steel) each 23″ diameter by 50″ face.

For instance—

—A large southern plant required a vertical warp drying machine with thirty-three tinned steel cylinders each 23″ diameter by 142″ face. We received the order. The machine has been shipped and is about to be installed now.

Take another instance—tenters. While the standard tenter is about 90′ long, we have made them from 10′ to 200′. They are adaptable in width from 20″ to that required by your individual work.

And what we try to build into a machine is best illustrated by what the superintendent of a large finishing plant said when a visitor asked why they always used Butterworth machines. He replied that Butterworth machines rarely needed repairs and seldom required adjustments. "These take time," he said. Then the superintendent pointed out some Butterworth machines which had been in daily use for thirty to forty years.

So no matter in what type of finishing machine you are interested, you will probably find it an advantage to allow the 102 years of experience behind the Butterworth organization to aid you.

We'll be glad to send requested literature.

FINISHING Butterworth MACHINERY

H. W. BUTTERWORTH & SONS CO.

Established 1820

Philadelphia Pa.

Canadian Representatives: W. J. Westaway Company
Hamilton, Ontario, Canada
Greenville, S. C., Office: Masonic Temple Building
Milton G. Smith, Mgr.
Providence Office. Turk's Head Building

BUTTERWORTH FINISHING MACHINERY